CONSTITUTIO
OF THE
UNITED STATES
Preamble
WE, the people of the United States, in order to form
a more perfect union, establish justice, insure domes-
tic tranquility, provide for the common defense, promote
the general welfare, and secure the blessings of liberty to
ourselves and our posterity, do ordain and establish this
Constitution for the United States of

ROCK PRODUCTS

JUL 19 1943

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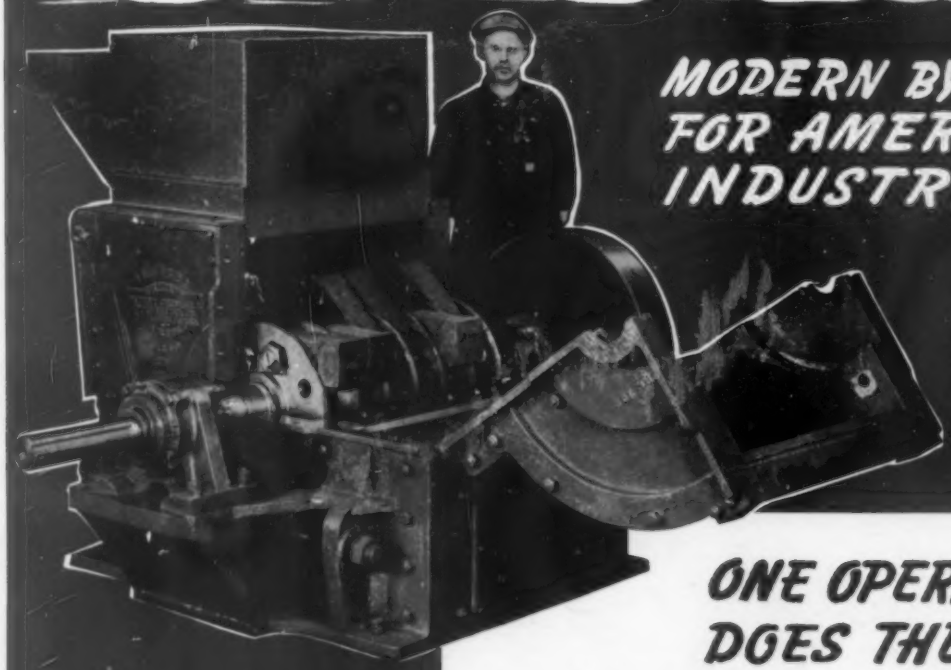
SPEED

MODERN BY-WORD FOR AMERICAN INDUSTRY.....



ONE OPERATION DOES THE JOB

SPEED plus satisfactory work is essential in America today. Along these lines the Williams "Slugger" Crusher and Pulverizer now makes it possible to crush large pieces of stone weighing from 75 to 100 pounds to 1¼", ¾" or agricultural limestone in One Operation. This not only eliminates costly sledging but also does away with the unnecessary expense of a primary crusher.

The "Slugger" represents the most advanced type of crushing equipment on the market today, and with seven sizes to choose from producing from 4 to 30 tons per hour, every producer whether large or small can now afford to install a Williams.

WILLIAMS FINE GRINDING EQUIPMENT WITH AIR SEPARATION

Outstanding "Slugger" Features

- **MANGANESE STEEL HAMMERS.** Heavy Duty Slug end Hammers are standard equipment in the "Slugger."
- **HAMMER ADJUSTMENTS OVERCOME WEAR.** Discs are arranged so that the hammers can be set out as they wear on the end.
- **MANGANESE STEEL ADJUSTABLE BREAKER PLATE.** Adjustable towards the hammers.
- **ELECTRIC STEEL FRONT END.** The part which holds the breaker plate is electric steel casting—3½ times stronger than cast iron.
- **COVER LINERS 1" THICK.** Manganese steel liners.
- **SIDE LINERS 1" THICK.** Manganese steel liners.
- **SEVEN SIZES.** 30 to 150 horse power, stationary or portable models.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO.

800 ST. LOUIS AVE. ST. LOUIS, MO.

★

THE LONG-LIFE COMBINATION

PROMAL CHAINS and FLINT-RIM Sprocket Wheels

● Long after ordinary cast ferrous chain completes its normal span of service, a Promal chain usually works on and on, even though subject to adverse conditions.

Promal chains are tough under shock and strain; they are hard in the face of abrasion; they have great strength in proportion to weight and bulk.

Where the work is hard on ordinary chains, Promal chains will give you longer, lower-cost service—more dependable operation—deferred replacement needs.

Flint-Rim Sprocket Wheels resist abrasion and will last several times as long as gray iron wheels. They have fully demonstrated that they are the most durable and satisfactory cast tooth type of sprocket wheels.

For best results use them both in combination on your elevators, conveyors and slow speed drives.

LINK-BELT COMPANY

Chicago Indianapolis Philadelphia Atlanta Dallas San Francisco
Detroit Boston Los Angeles Seattle Portland, Ore. Toronto

Other offices and distributors in principal cities

0907-F

TOMORROW IS TOO LATE—BUY THAT WAR BOND TODAY

LINK-BELT CHAINS AND SPROCKETS

For Conveying and Mechanical Power Transmission

Write for your copy of the CATALOG

KNOX
Valves-Couplings-Nipples-Clamps-Menders

KNOX MANUFACTURING CO.
818 Cherry St. Phila., Pa., U.S.A.
SINCE 1911 PRODUCERS OF
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from MILL to

to KILN

A Cement Circuit Triple Play That Has 'Em All Stopped Cold!

The BIRD CONTINUOUS CENTRIFUGAL CLASSIFIER takes the slurry (with the clay already added) right as it comes from the mill and relays all the fines directly to the slurry tanks ahead of the kiln, without thickening or filtering. It delivers up to a ton a minute. It does the job automatically and dependably day in and day out—in a space only 13½ x 10 feet . . . Why not see if it doesn't make the winning combination for *you?*

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Pick Your

HERE ARE FOUR OF THE MOST PRESSING

Labor Shortage?

Does part of your process use men needlessly? Remember, crushing is a *machine* industry!

Unexpected Breakdowns?

How many of your key machines were designed for 24-hour-day service? Good point to check today!

Collaboration of specialists is basic in A-C Cooperative Engineering.

WHICHEVER IT IS — CALL

MEN must work together better than ever before to win this war... *and so must machines!*

If failure of machines to work together properly is at the root of your wartime processing problem, remember there's one company that *specializes* in making machines "team up"... Allis-Chalmers.

Only Allis-Chalmers Makes a Complete Line of this Equipment!

Jaw Crushers	Gyratory Crushers	Crushing Rolls	Pulverators
All-steel primary and fine reduction. ¼"-12" product.	High-speed primary and secondary. 3" to 60" size feed.	6 different types. Reduction ratios from 5-1 to 10-1.	"Multi-impact" reduces non-abrasives to cubical shape.

Picture!..

PROBLEMS FACING PROCESSORS TODAY —

Lagging Schedules?

Maybe you have a bottleneck machine in your plant — possibly an added machine would load up other units.

Overworked Engineers?

Outside engineering cooperation may be all that's needed to get your staff out of a hole.

ON ALLIS-CHALMERS!

Here's a company that engineers and builds *all types* of basic processing equipment . . . in the *complete line* highlighted below.

Thus when you call on Allis-Chalmers Cooperative Engineering, you deal with engineers who are "complete line" engineers. They know *all* phases of the basic processes . . . how they all *fit together.*

Result: you get recommendations that make existing equipment "team up" better . . . to give you greater wartime production.

Don't let another day go by without putting Allis-Chalmers Cooperative Engineering to work on *your* problem. No obligation, of course. Call your nearby A-C district office. Or write ALLIS-CHALMERS MFG. CO., MILWAUKEE, WIS.

A 1562B

WE WORK FOR VICTORY — WE PLAN FOR PEACE

Grinding Mills	Pyro-Processing	Vibrating Screens	Motors & Drives	Centrifugal Pumps
30 types — over 3600 in service on every material.	Kilns, coolers, dryers, roasters engineered in all types.	Efficient separation and dewatering — 8 different types.	Unbeatable team—Lo-Maintenance Motor & Texrope V-belts.	Largest line, highest efficiencies — built with motors.

Some of the SECOND BILLION!

Empty shells for du Pont Electric Blasting Caps as they come from the Drawing and Beading Machines

OVER A BILLION du Pont Electric Blasting Caps have been sold to date—a remarkable endorsement by users everywhere. There's good reason why more of these caps are used than of any other make. Du Pont Electric Blasting Caps are designed and manufactured according to the guiding principle that *the most dependable detonator is the safest detonator*. The metal shunt of these caps provides a positive short circuit that gives added protection against accidental firing. A paper band holds wires in a handy figure 8 that prevents tangling, kinking or damage to insulation. Rigidly inspected before shipment, du Pont Electric Blasting Caps give you maximum dependability that means added safety on the job. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Delaware.

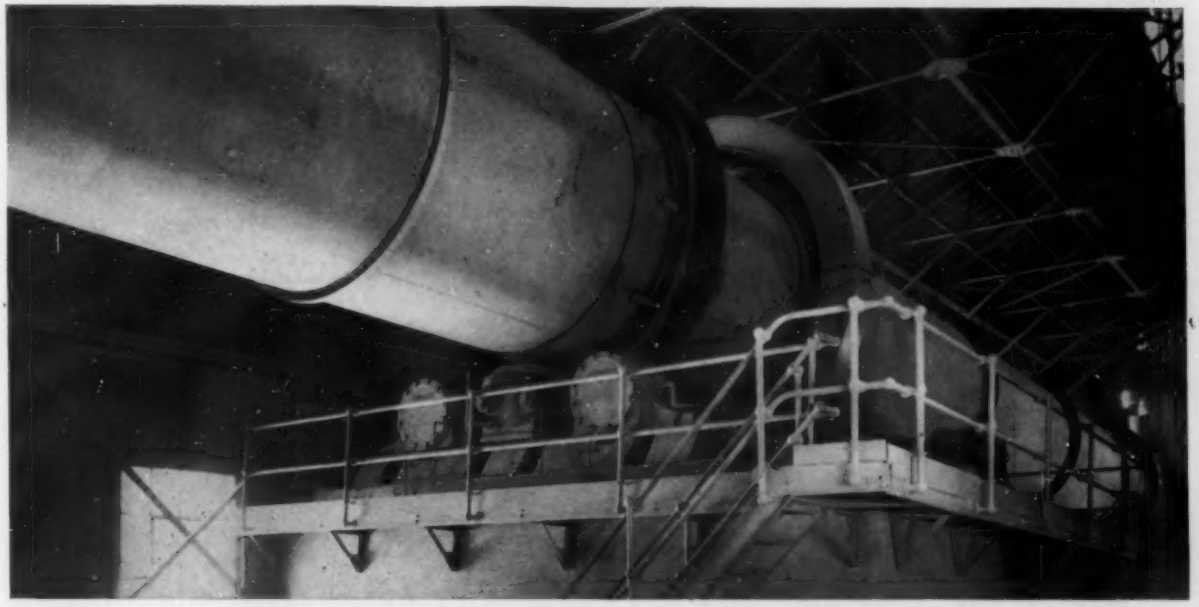
SAVE FATS FOR EXPLOSIVES—Fats are urgently needed for making glycerin, an essential ingredient in production of high explosives. Urge housewives to aid the war effort by taking waste fats to their butcher.

DU PONT
REG. U. S. PAT. OFF.

Electric **BLASTING CAPS**

TRAYLOR

KILNS ★ COOLERS ★ DRYERS



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

"'WAY BACK WHEN" Traylor built its first Rotary Kiln, the size of that first unit (it was 9'-0" dia. x 175'-0") was considered quite unusual, and it probably was among the largest of that day. Nowadays, that is thought to be a very ordinary size, since diameters run up to 12'-0" and lengths to 450'-0". Also, Traylor activity in building Rotary Kilns, instead of being confined to the cement industry, as in that former day, now embraces lime manufacture, chemical and process industries and metallurgy. In fact, many of "the greatest" in all of these industries have standardized upon Traylor Rotary Kilns—and Traylor Rotary Coolers and Dryers, as well.

The march of progress brings many changes in all things, but one characteristic of Traylor Rotary Kilns, Coolers and Dryers HAS NOT CHANGED, from the very beginning—they were always, as they are today—the finest of construction procurable, and the most efficient in performance. This is true because, in addition to the metal of which each unit is composed, there are built into it many ideas, represented by many devices to increase efficiency and decrease costs—ideas based upon an intimate knowledge, on the part of our engineers, with the work that it must do, knowledge gained by constant observation and study.

At this time, Traylor Rotary Kilns, Coolers and Dryers are not procurable except for the most urgent necessity in the furtherance of the war program, but wise operators, who are thus "blacked out" temporarily, will choose such a time to prepare for a future that is certain to be most competitive. Our technical facilities are available for just that purpose. We invite correspondence.

SEE OUR BULLETIN No. 115

TRAYLOR

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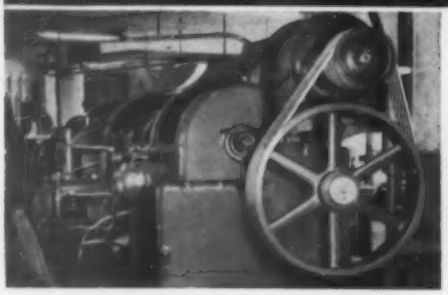
In Use for Years by Leaders of U. S. Industry



In a
Leading Machine-Parts Plant—

belts on screw machines and grinders are subjected to a severe oil condition. GATES special synthetic belts were adopted 100% for this severe service after months of testing proved that they last three times as long as any rubber belt ever used.

A Large User of
Rear Engine Coaches

could get only 13,000 to 14,000 miles from natural rubber belts in rear engine coach and bus service where rapid and frequent acceleration and deceleration create high temperatures. GATES special synthetic belts are giving double the life in this demanding service.

This
Outstanding Aircraft Factory

—one of the nation's leaders—has found that Gates special synthetic belts last three to four times as long as regular rubber belts on machines where the belts are badly exposed to oil.

GATES
Heat and *Oil* V-BELTS
of *Special* Synthetic Rubber

Are Giving **Up to 230% Longer Life than natural rubber belts when subjected to heat and oil . . . Initial cost at present is higher . . . recommended to meet especially severe oil and heat conditions.**

Gates has been building V-belts with synthetic rubber for many years. Thousands upon thousands of Gates V-belts without an ounce of natural rubber in them have now seen years of service in many of the nation's leading industrial plants.

From this long experience with synthetic rubbers, Gates engineers have developed a V-belt built of a special synthetic which withstands severe heat and oil conditions that natural rubber simply cannot stand. The initial cost of these special belts is at present higher than Gates Standard Vulco Ropes. That is why the Gates Field Engineer you consult now recommends this special heat and oil belt only if its higher cost will be more than offset by longer service life.

There are many commercial types of synthetic rubbers. Gates has had wide experience in the use of all of them.

You have doubtless seen recent press dispatches stating that all V-belts will shortly be made of synthetic rubber. Gates long experience and success in this field clearly represent a substantial advantage in giving you a synthetic rubber V-belt of truly superior quality.

THE GATES RUBBER COMPANY

437

Engineering Offices and Stocks in All Large Industrial Centers

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this team can cut . . .

YOUR POWER COSTS!

BUDA *Low Pressure* DIESEL

NO ordinary engine could offer the steady, shift-after-shift, low-cost power output that Buda's modern engineering skill designs into Buda Diesels . . . that Buda's 65 years of manufacturing experience translates into a smooth, rugged, longer-lived power plant to cut *your* power costs to a minimum.

Want proof? Call your nearby BUDA distributor —let him show you the features that make a BUDA engine—Diesel or gasoline, 20 to 340 h.p.—your best investment in power today!

Remember . . . BUDA Powered means BETTER Powered—Specify BUDA engines on the equipment you buy!

the BUDA *co.*

Harvey (Chicago Suburb) Illinois

EQUIPMENT that wears as much as ½" to 1" undersize before being removed from service should be hard-faced with Bare Electric Stoody Self-Hardening. There are many advantages for using this alloy on all equipment suffering a wide latitude between worn dimensions and original size—Parts can be brought back to original size with a single pass of hard metal since deposits can be made up to ⅜" deep*... Chipping time between passes is eliminated completely... and a second repositioning of the work piece is unnecessary.

Bare Electric Stoody Self-Hardening possesses the same physical characteristics of wear resistance, toughness and hardness as the coated rod. Apply it to the following equipment for maximum depth of deposit with minimum expended time and labor: Roll Crushers, Jaw Crushers, Swing Hammers, Grizzlies, Sand Pump Impellers and Casings, Baffle Plates, Shaker Pans, etc. A trial order of 200 pounds at 50c per pound, f.o.b., Whittier, Calif., will prove the outstanding advantages of ¼" Bare Electric Stoody Self-Hardening for any of the foregoing applications. Orders should be accompanied with a priority rating of AA-4 or higher.

*Using ¼" electrodes.

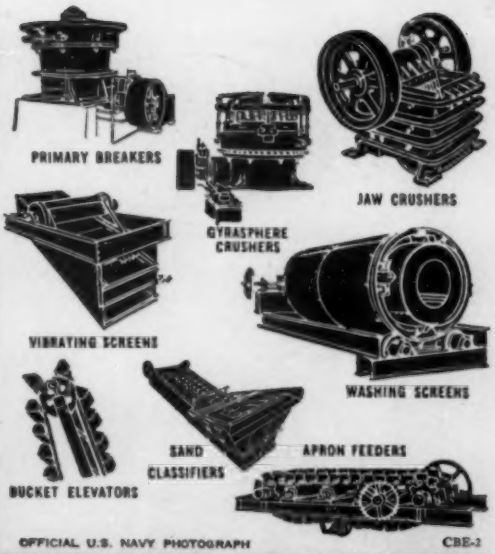
STOODY COMPANY
1140 West Slauson • Whittier, California

STOODY HARD-FACING ALLOYS
Stop wear... Eliminate Repair

"ALL ROADS LEAD TO ROME..."

and Berlin... and Tokyo

IT'S THE NAVY'S SEABEES serving alongside combatant forces, who are literally paving the roads to victory. Here we see them on an island in the South Seas. That may be an airplane landing strip they're building . . . or an access road. They're using crushed coral rock. And it's just possible it was crushed by a Telsmith Crusher. The Seabees *are* using a lot of Telsmith equipment *and that's a fact.* Most of Telsmith's output now goes to the Navy—to build Naval bases, docks, various shore structures and facilities overseas. *Get Bulletin E-11.*



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FOR SAND, GRAVEL, ROCK CRUSHING PLANTS

SMITH ENGINEERING WORKS, 508 EAST CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

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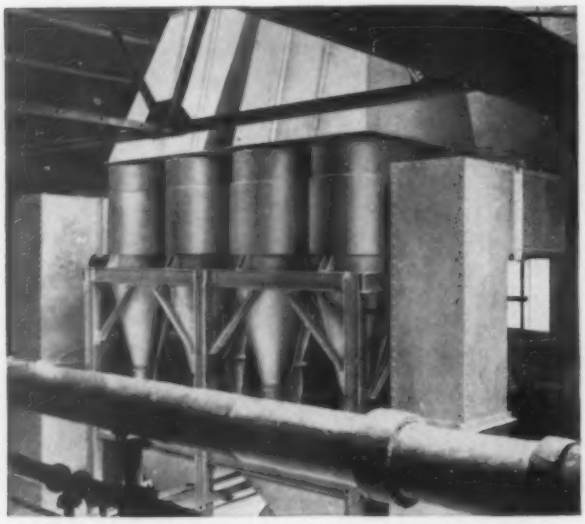
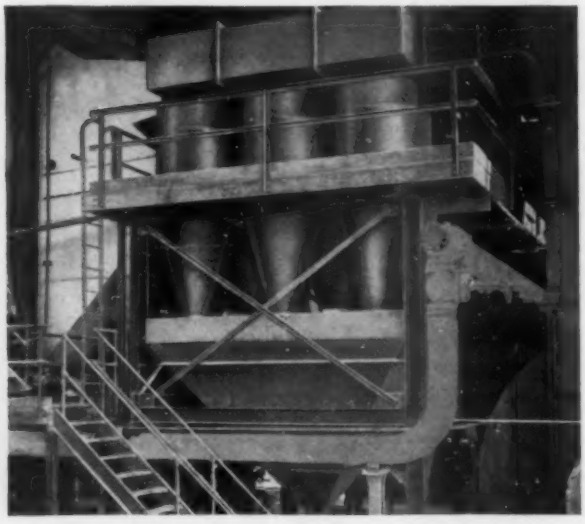
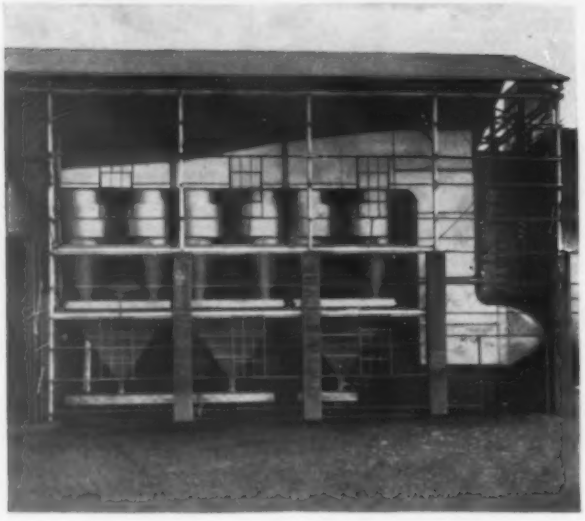
The A B C *of why so many cement plants rely on* buell

DUST RECOVERY SYSTEMS







A *Low initial cost*

B *High efficiency*

C *Low operating cost*

Send for your copy of Buell's new, factual 28-page book. Ask for Bulletin G-842.

BUELL ENGINEERING COMPANY, Inc.

Suite 5000, 2 Cedar Street, New York

SALES REPRESENTATIVES IN PRINCIPAL CITIES

BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

These two kinds of wire rope are made in our factory of the same special analysis high carbon steel, the same carefully controlled heat treatment and continuous wire drawing process. As made by our skilled craftsmen both give you plus value.

Yet there is a difference which means money-in-your-pocket. It is this: In ordinary wire rope of any make, the wires are "laid" into position without first being relieved of stresses set up through changing wires from straight to helical or spiraling shapes. Under these unresolved stresses, the wires have a strong tendency to fight each other and will fly apart when the seizing wire is removed. This wasted effort cuts down the resistance to bending fatigue of the rope as a whole.

In *Union-formed* wire rope, the method of helical or spiral shaping the wires in it before they become component parts, entirely frees the rope of shaping stresses. Thus preformed, parts lay in their positions in such perfect repose that they will not fly apart—in fact, often must be pried from position. *Union-formed* wire rope, therefore, utilizes its full stamina for maximum resistance to bending fatigue. That is why *Union-formed* wire rope bends more easily. Every wire and every strand pulls together to wear longer.

This is only one of 10 time-saving, money-in-your-pocket advantages of *Union-formed* wire rope. To the limit permitted under conditions of war, Union is striving to satisfy urgent needs outside of war production.

UNION WIRE ROPE CORPORATION
2156 Manchester Ave., KANSAS CITY, MO.
Tulsa • Houston • Chicago • Salt Lake City • New Orleans
Monahans, Texas • Portland • Ashland, Ky. • Atlanta

IF YOU ARE NOT ON OUR MAILING LIST send for these bulletins: "ROPE DOPE," "Socketing Wire Rope," "Splicing Wire Rope," "Correct Handling of Wire Rope," and "Wire Rope Lubrication." Engineering information supplied without obligation. G-43

UNION WIRE ROPE CORP.
union *Wire Rope*
"THE ULTIMATE IN LOW COST WIRE ROPE"

Each ★ Represents Another 6 Months of Star Performance

WAR PRODUCTION EXCELLENCE WILL BRING POST WAR PLUS VALUES

WHEN YOU NEED PREFORMED WIRE ROPE
SPECIFY **union-formed**

Cedarapids

Built by IOWA

for KOSS CONSTRUCTION COMPANY

Des Moines, Iowa

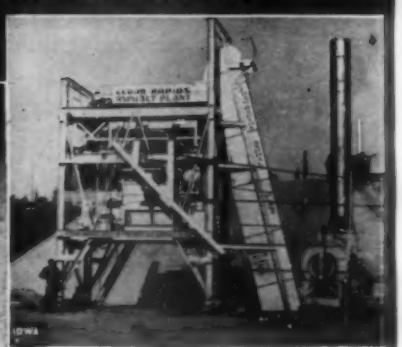
THERE is a rumble through the night. The headlights of another truck stab the darkness that envelops the stock piles by the railroad tracks. It rattles emptily under the discharge to take its batch of sticky black top and it rumbles heavily away again with several square yards of airport runway in the raw, mixed and produced by American ingenuity as typified by Iowa Cedarapids Asphalt Plants.

Hour after hour, through the night and day, the trucks rattle up and rumble away and the ribbons of black runway roll out behind them. 53,000 tons in 44 days operating two 10 hour shifts a day — at an average of 85 tons an hour. That's the kind of service this Cedarapids Asphalt Plant gave Koss Construction Co., of Des Moines, Iowa at Perry, Oklahoma.

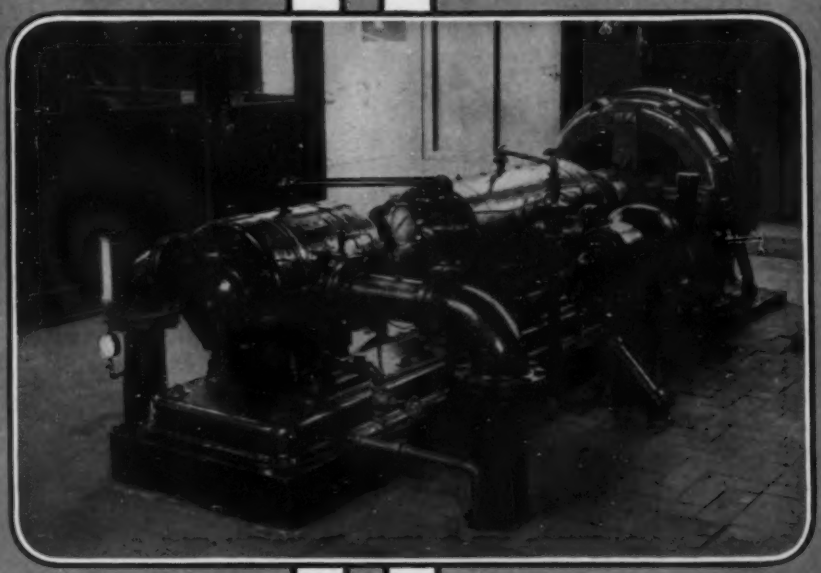
That's the kind of service Cedarapids asphalt plants are giving all over the country.

There is a time coming when we will again be a free people — free to come and go and enjoy the natural richness of a great nation. It will call for highways, airports, dams and buildings. People are going to go places. When that time comes the dependable wartime service that Iowa Cedarapids plants give can be the difference between successful and unsuccessful contracts. Come to headquarters for aggregate producing equipment.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa



A Capacity for every problem



ROTARY COMPRESSORS

Fuller Rotaries are doing their part for victory in many war industry plants. Shown above is one of fourteen Fullers doing duty for an eastern steel company, running night and day with minimum time out for repairs.

They'll still be running long after victory has been attained and, at maintained original capacities . . . because they're built for just that kind of service. Simple design, rugged construction . . . only three moving parts: rotor—bearings—blades.

Bulletin C-5 illustrates and describes these machines. It's yours for the asking.

fuller COMPANY

CATASAUQUA, PENNSYLVANIA

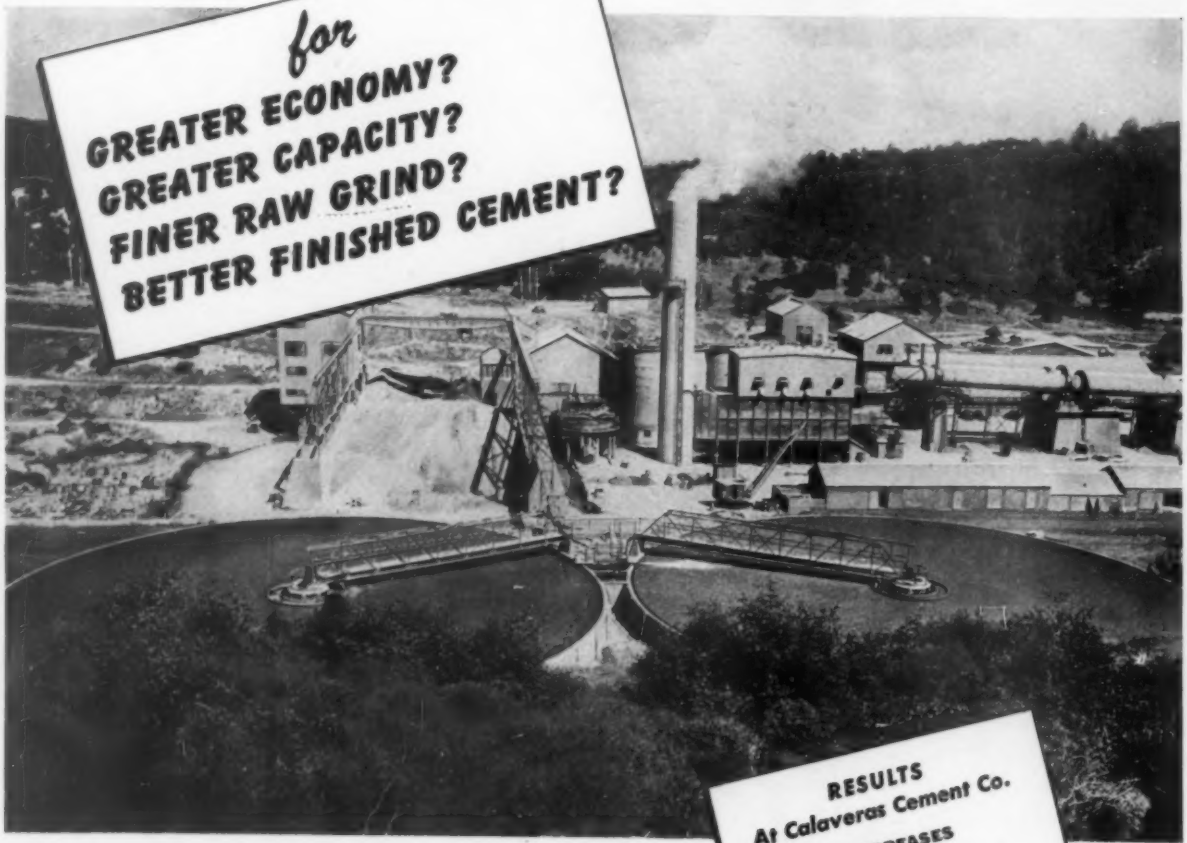
CHICAGO — MARQUETTE BLDG.
SAN FRANCISCO — CHANCERY BLDG.

C-84

FULLER-KINYON, FLUXO, AND AIRVEYOR CONVEYING SYSTEMS · · · ROTARY FEEDERS AND DISCHARGE GATES
ROTARY AIR COMPRESSORS AND VACUUM PUMPS · · · AIR-QUENCHING COOLERS · · · BIN SIGNALS

Want to convert your wet process cement plant

for
GREATER ECONOMY?
GREATER CAPACITY?
FINER RAW GRIND?
BETTER FINISHED CEMENT?



RESULTS
At Calaveras Cement Co.

CAPACITY INCREASES
Raw Grinding—61%
Rotary Kilns—13%

POWER DECREASES
Raw Grinding—36%

FINER RAW GRINDING
94%—200 mesh; formerly 88%
0.5% + 100 mesh; formerly 3-4%

BETTER CEMENT
Better quality due to elimination of stray oversize and finer grinding. More uniform slurry as to particle size, moisture and composition. Improved burning conditions.

Dorr C.C.G. with Dorr classifiers is not only for the new wet process cement plant starting from scratch with individual mills for primary and secondary raw grinding. Existing plants with raw compartment mills or individual mills can be converted without interrupting operation—and with definite results!

What may be expected is indicated by the production results shown at the right from the Calaveras Cement Co.'s plant at San Andreas, California—which now employs partial Dorr C.C.G. Calaveras is a conversion from open circuit grinding—and the results speak for themselves.

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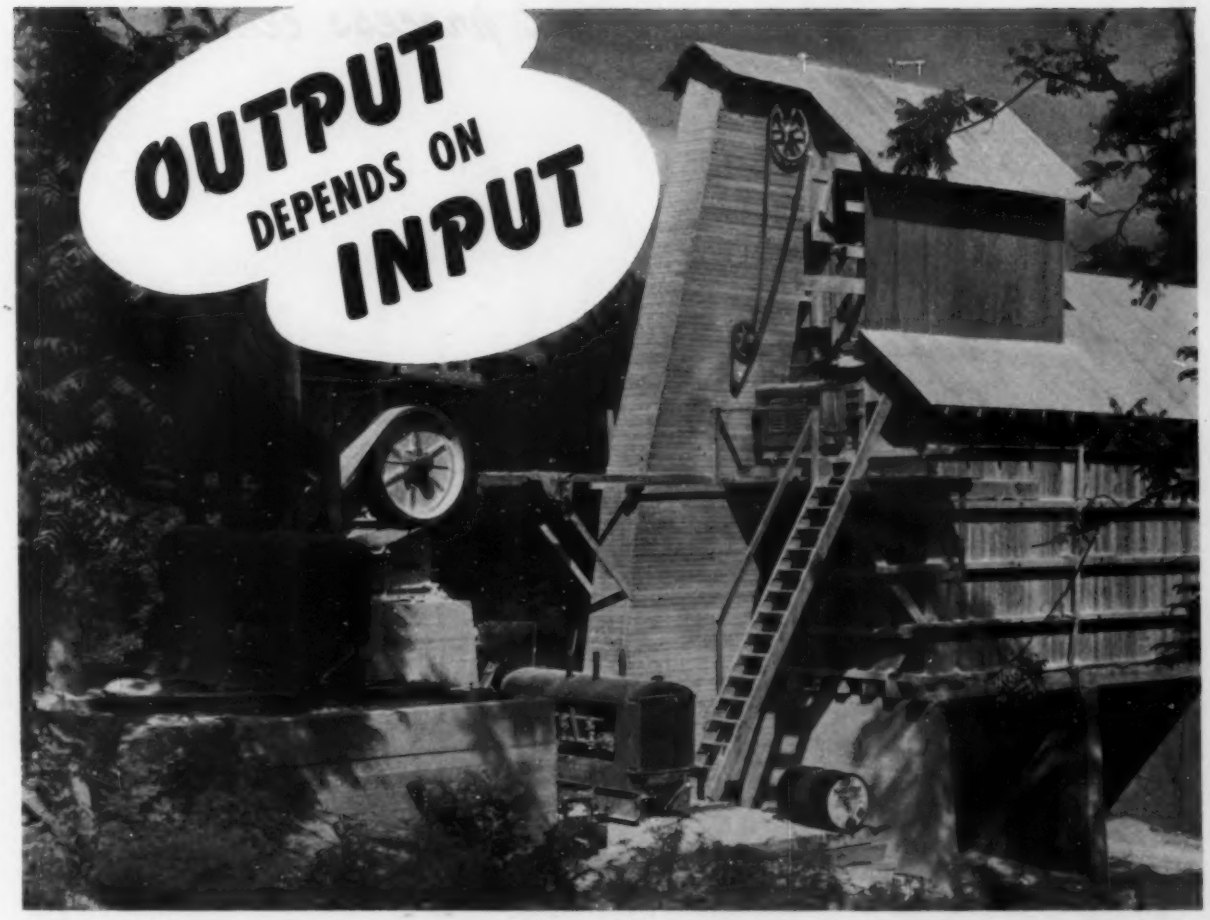

The production you get out of your machines depends largely on the kind of power you use to drive them. A machine is no better than the engine that powers it. That's why it is so important to use reliable power that performs consistently shift after shift . . . day after day . . . with minimum time out.

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PMCO WELDED DIPPERS

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No. 1001 with 2½ yard
PMCO WELDED DIPPER
speeding construction at Lambert Field, St. Louis, Missouri.

Welded construction of PMCO dippers eliminates unnecessary weight that gives added daily output to shovels up to 30 per cent. The welded dipper is a reinforced dipper of unusual strength that keeps going under all conditions to speed war projects.

We operate the largest and most complete manganese steel foundry in the United States.

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4710 West Division Street, Chicago, Illinois

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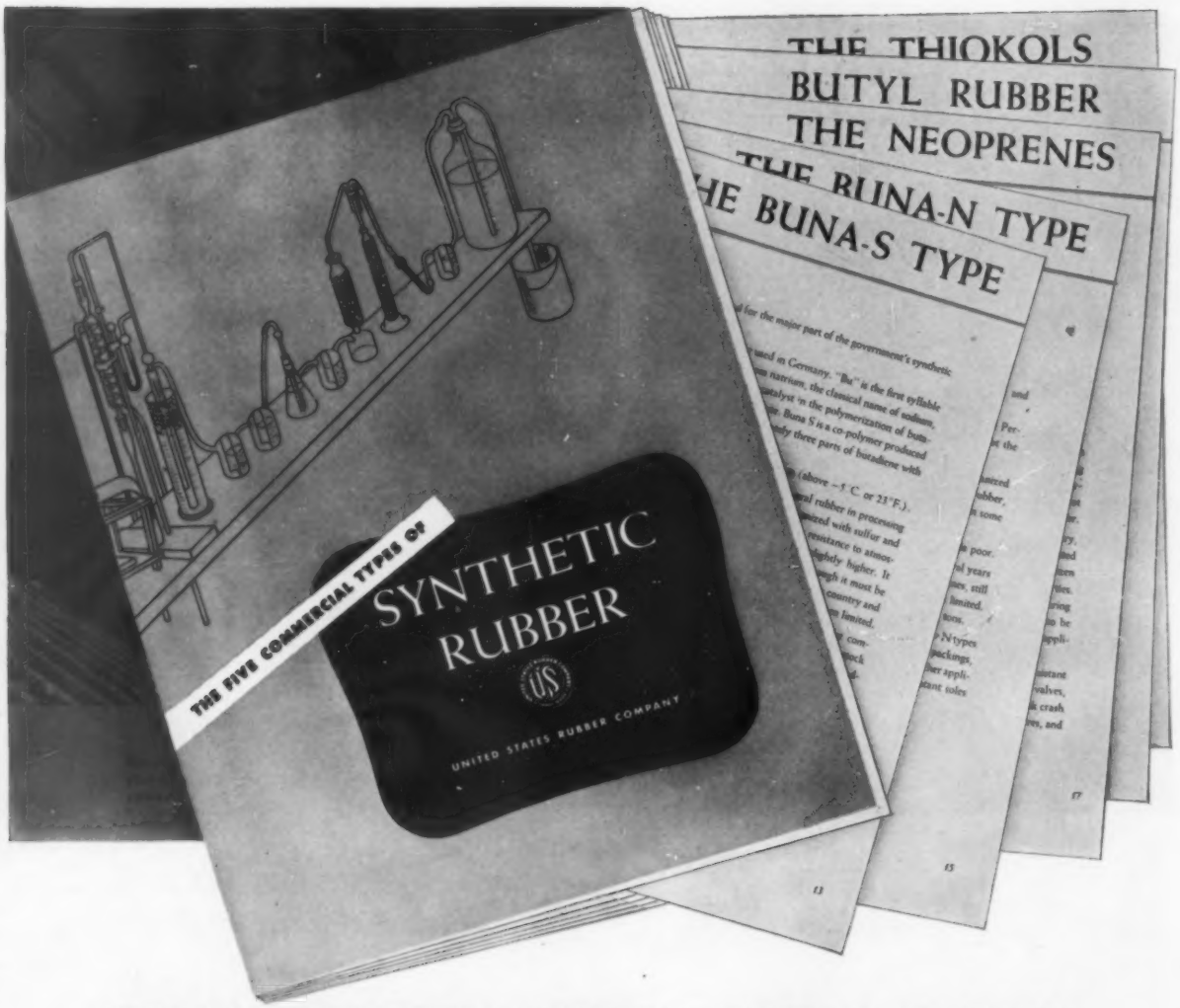

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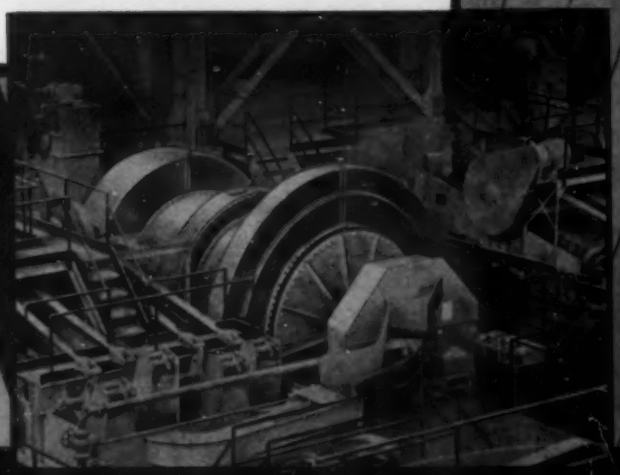
Ballmills, tubemills and multi-compartment mills—wet or dry grinding—open or closed circuit—also air swept for grinding and drying.

GRINDING MILLS



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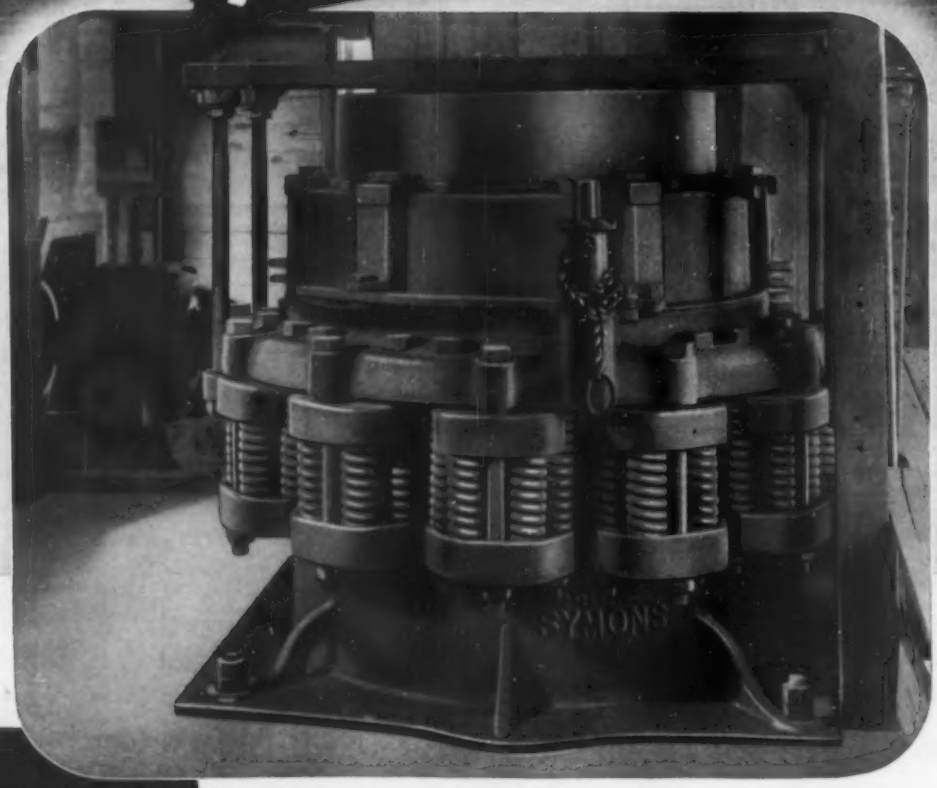

Orange Quarry Co.
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TAKING an 8 inch feed of trap rock from the primary jaw crusher and producing a minus ¾ inch product is not a difficult task for a 4¼ foot Symons Standard Cone. This crusher was developed to meet this and similar crushing conditions where big tonnage of fine product from large size feed is required. When followed by a Symons Short Head Cone, this combination of Standard and Short Head is ideal for quantity and low cost production of materials as fine as minus ⅛ inch.

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Place two filled Bemis Multiwall Paper Shipping Bags so that they are supported only by their ends. Then continue to pile filled bags on top of them. (The stack will get pretty high before those Bemis Multiwalls give way!)

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Exacting quality control plus Bemis manufacturing methods maintain this extra strength factor in spite of wartime restrictions and raw material difficulties.

Take advantage of Bemis quality and service when you reorder. Samples will be sent for testing without obligation.

Photograph of actual test made at the Arthur Ruprecht Sand & Material Co., St. Louis, Mo.

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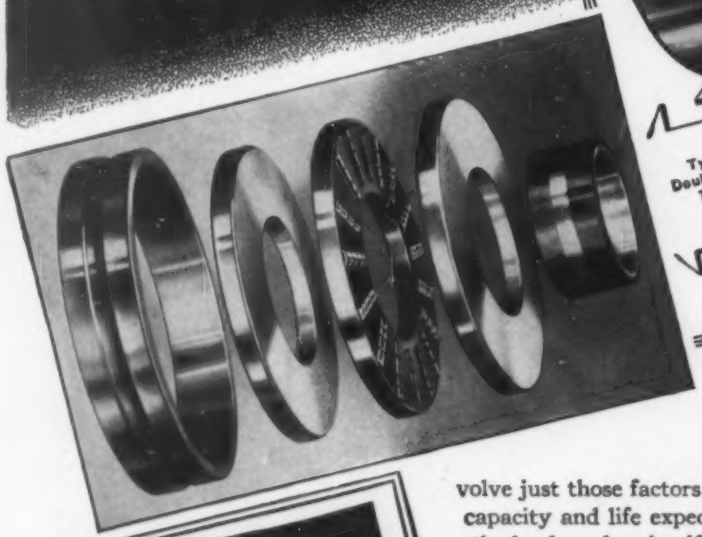
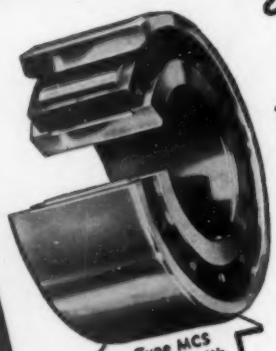
BEARING LOADING

is the

RIGHT LOADING!





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FOR

1. higher bearing capacity in the same dimensional limits
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5. longer bearing life under all loads

● The advantages of Rollway's right-angle bearing loading are so self-evident as to be axiomatic. They involve just those factors that are used in computing the carrying capacity and life expectancy of *every* bearing. In short, reduce the load per bearing if you want to lengthen the life, counteract shock and vibration, or provide freer running.

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- All radial loads carried at right angles to the roller axis.
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BEARING COMPANY, INC., SYRACUSE, NEW YORK

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FOR THESE AND MANY OTHER ASSEMBLIES

Develop full strength of wire rope up to 1¼ inch in ONE economical fitting

Get wire-rope-rigged equipment back on the job faster . . . release skilled wire rope men for other work . . . by specifying Roebling complete *SWAGED* assemblies that develop 100% of the strength of the rope! *Convenient*—your rope comes to you cut to length and fitted on one or both ends, all ready to go to work. *Economical*—you can get these assemblies for a lot less than it would cost you to splice or socket them on the job.

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Pacific Coast Aggregates

Ready Mixed Concrete Operators Everywhere Stick to Smith-Mobiles

After putting their first Smith-Mobile through its paces, users invariably come back for additional Smith-Mobiles. As a result, many a fleet today is 100% equipped with this modern, dependable truck mixer.

Owners instantly recognize Smith-Mobile's many superior features . . . the HIGH DISCHARGE without hoist . . . the CONTROLLED DISCHARGE without segregation . . . the VISIBLE MIXING feature . . the successful REAR END CHARGING . . . the Smith way of introducing water through the feed opening. They appreciate Smith-Mobile's GREATER SPEED and EFFICIENCY.

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RAYMOND BOWL MILL

gives the utmost direct-firing efficiency

WITH THIS "VICTORY FUEL"

With gas and oil largely confined to military needs, the increased use of **coal** puts the spotlight on the Raymond BOWL MILL as today's best answer to the problem of firing rotary kilns and industrial furnaces.

It has wide range capacity and handles any grade or moisture coal. It maintains uniform grind at all rates of feed. It will operate on a 24-hour basis, month after month, without shutdowns. With the panel board control, very little attention is required from the operator, and one man can easily take care of a battery of Bowl Mills.

For direct-firing cement, lime, dolomite kilns, and industrial furnaces, the Bowl Mill will pay back its investment cost in extra economies.

Write for Raymond BOWL MILL Catalog Number 43

SINCE 1887

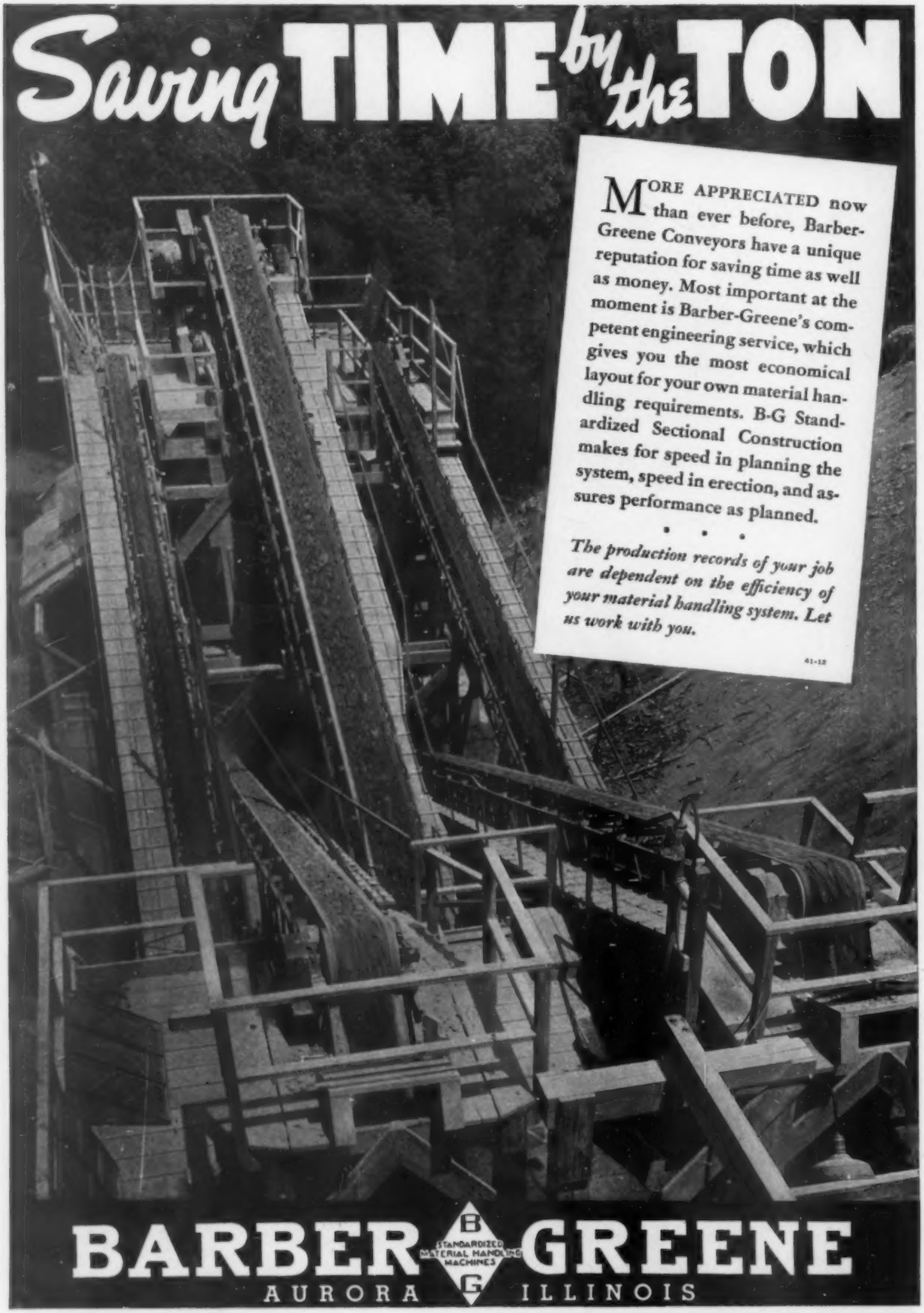
RAYMOND PULVERIZER DIVISION

COMBUSTION ENGINEERING COMPANY, INC.

1307 North Branch Street CHICAGO

Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

Saving TIME by the TON



MORE APPRECIATED now than ever before, Barber-Greene Conveyors have a unique reputation for saving time as well as money. Most important at the moment is Barber-Greene's competent engineering service, which gives you the most economical layout for your own material handling requirements. B-G Standardized Sectional Construction makes for speed in planning the system, speed in erection, and assures performance as planned.

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The production records of your job are dependent on the efficiency of your material handling system. Let us work with you.

41-12

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STANDARDIZED MATERIAL HANDLING MACHINES

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MARION'S FIRST INTEREST IS TO WIN THIS WAR . . .

What the Bill of Rights means to our fighting men is summed up in recent victories in every theatre of war. What it means to Marion is reflected in the continuous stream of Marion machines rolling off the assemby lines . . . the ever-increasing production schedules . . . the extra speed, stamina and dependability Marion engineers are building into these machines . . . the remarkable records of performance wherever they are employed. This is Marion's answer to those who would destroy our Bill of Rights . . . Marion's way of helping to win the war as quickly as possible.

THE MARION STEAM SHOVEL CO., Marion, Ohio.

MARION

SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • PORTAL CRANES • WALKERS

WORKING FOR VICTORY: DIGGING—Coal • Magnesium • Iron Ore • Copper Ore • Bauxite • Manganese • Nickel Molybdenum • Sand and Gravel • Clay. MATERIAL HANDLING—Shipbuilding and Cargo Loading. BUILDING—Airports • Ordnance Plants • Army Camps • Marine Bases, etc.

Storm over Holland

DAILY you hear the allied planes winging high over Holland to carry destruction into Nazi-land. . . . Then comes the happy day when they rain bombs on the very war plant where you are slaving for the hated invader. You're glad to chance it, Willem—and run for shelter with a smile on your face!

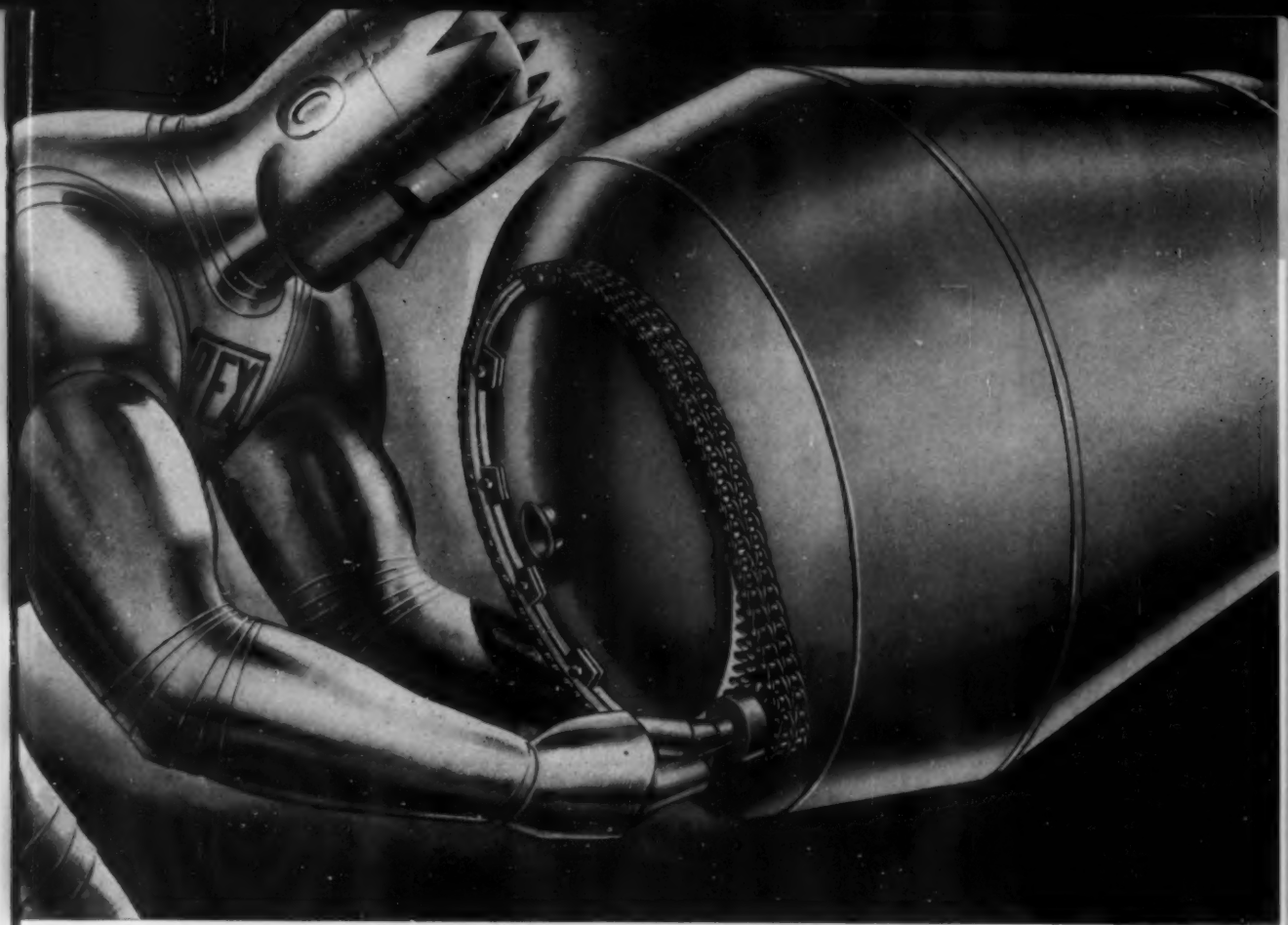
We are blasting our common enemy in another way, too. In American mines and quarries, we are blasting out millions of tons of earth's good minerals essential in the manufacture of war equipment. Our mining men are needed specialists, and their work is furthered by safety. For example: Ensign-Bickford Safety Fuse and Primacord-Bickford Detonating Fuse—dependable products that are helping to bring ultimate freedom to Holland.

Victory Begins Underground!

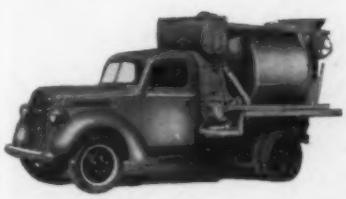
G-P

THE ENSIGN-BICKFORD CO.
SIMSBURY, CONNECTICUT

Primacord-Bickford
Detonating Fuse



HE CUSHIONS ROAD SHOCKS *with his Flexible Drive . . .*



Truck mixers, rolling along the road, pick up drum vibrations and shocks. These shocks, if transmitted to costly transmissions, power plants and other vital working parts, cause damaging strain and excessive maintenance.

Knowing this, Rex Mechanical Engineering—Rex M. E.—designed his Moto-Mixer with the exclusive flexible chain belt drive—the sturdiest drive in the industry. Because this chain drive goes completely around the drum, and because of the inherent shock absorbent ability of chain belt, each link of the chain absorbs its share of the shock load. This cushions the transmission and other vital working parts from damaging road and mixing shocks. There are no unyielding gears and pinions to bind and create damaging strain as the truck weaves over the road.

Rex M. E. has mounted his drive shaft parallel to the axis of the drum—a direct transmission of power from its source to its application—the most efficient method of transmitting power.

This is but one of the many features which Rex M. E. has incorporated in the design of his Moto-Mixer. Through many years' experience in the design and manufacture of equipment for the mixing, placing and hauling of concrete, Rex M. E. has learned the problem of the contractor and construction engineer. In the building of Rex construction machinery, he has applied that knowledge in the way most helpful to them.

To give you the whole story, Rex M. E. urges you to write Chain Belt Company, 1649 W. Bruce St., Milwaukee 4, Wis., for complete information on his Moto-Mixer.

REX **CONSTRUCTION MACHINERY**

Concrete Mixers • Moto-Mixers • Pumpcretes • Pavers
Mortar and Plaster Mixers • Speed Prime Pumps

CHAIN BELT COMPANY OF MILWAUKEE

Conserve steel by making every piece of equipment last longer. Steady production by keeping your machines in uninterrupted operation. Since the operation of your machines depends upon wire rope, make sure your operators keep these commandments:—

1. Inspect, clean and lubricate all wire rope regularly. Tighten fittings.
2. Be sure the rope is the proper one for the service. Ask your Hazard wire rope man.
3. If drums or sheaves are small, or the kinking tendency pronounced, specify LAY-SET Preformed, the rope that resists bending fatigue and kinking.
4. Check your sheave or drum grooves. Worn grooves play havoc with wire rope.
5. Don't let rope rub against any standing part.
6. If the rope deviates from the center plane of the sheave more than 1½ degrees, undue wear will result.
7. Keep sheaves aligned and bearings tight and properly lubricated.
8. Don't allow bad spooling on drums. Hazard LAY-SET Preformed spools evenly under most conditions.
9. Don't jam on power or brake. Jerky operation accelerates rope failure.
10. Don't let a load spin and twist the rope.

Get the experienced recommendations of a Hazard wire rope man. Specify Hazard LAY-SET Preformed for a rope that resists bending fatigue, kinking and snarling. Use LAY-SET because it spools better, is faster and safer to handle, lasts longer.

Keep equipment in good condition. Make it last longer.

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Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.
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TRADEPRESS PUBLISHING CORPORATION, 309 W. JACKSON BLVD., CHICAGO, ILLINOIS

"Bread from Stones"

WHEN WE CONCLUDED the editorial in the April issue on "Man Is What He Eats," suggesting that trap rock and granite quarry operators might be overlooking a market in agriculture, it must be confessed, we did so more or less blindly. The idea was suggested by a recent re-examination of Frank W. Clarke's very interesting book on "Data of Geochemistry" (U. S. Geological Survey Bulletin 770), which has ever been a source of inspiration in connection with these rock product industries. This book gives chemical analyses of all kinds of rock, and analyses of these igneous rocks show they contain just about all the soil minerals.

The April editorial produced many interesting and helpful comments, not the least of which was a letter from our good friend, G. A. Austin, president of the Consolidated Quarries Corporation, Decatur, Ga. Mr. Austin writes: "For several years I have conducted some rather unscientific tests on the use of granite fines and have thought I observed soil improvement, but, of course, there are so many factors entering in, that I do not have the supporting data. I am enclosing a copy of an article about a book by Julius Hensel. I don't know the author or the origin of the article nor am I able to check the authenticity of the quotations. We are now conducting some real tests with a scientific truck gardener using granite fines, all below 100-mesh."

The copy of the unsigned article which Mr. Austin sent us is entitled, "A Resumé of the Work of Julius Hensel, German Chemist, in the Field of Plant Nutrition." It seems that sometime in the last half of the 19th century Julius Hensel, who made a life-long study of the decline in productivity of the soils in Germany—a decline marked by a corresponding increase of parasitic infestation of the soil's products—wrote a book entitled, "Bread from Stones." Hensel was struck by the fact that virgin soils, particularly at the bases of mountains, were always fruitful and their vegetation free from parasites that infested the vegetation on soils elsewhere.

Hensel's study showed that at least 18 different mineral and gaseous elements enter into the composition of organic matter in measurable quantities, and he set himself about making provision for supplying these elements to the soil on which he conducted his experimental work. Those mineral elements he found in greater part in the granites of the Bohemian mountains. He had these granites ground (in an old-fashioned stamp mill), added 3 parts of lime and 2 parts of gypsum to 10 parts of pulverized granite, and used this mixture with very gratifying results. The soils so treated with his "rock meal" not only produced bountifully, but the vegetation was of vastly superior quality and free from parasitic growths.

Hensel met with a great deal of opposition from the "agricultural experts" of his day, who contended that nitrogen, phosphorus and potash alone constituted "the complete fertilizer." Fortunately, since then, and in fact only in the last decade, agricultural authorities have begun to appreciate that calcium (lime or gypsum), magnesium (dolomite), iron and other mineral elements are at least desirable fertilizer ingredients.

Finally, Hensel announced "the discovery that the parasitic pests so common to plant life, instead of being entities of extraneous origin, are evolutions purely incidental to impoverished and sickly plant structures, all of which phenomena hark back to mineral starvation. Furthermore, he held, that in pursuance of Nature's utilitarian-compensatory scheme of life, these parasitic organisms form a part of her machinery for disposing of organisms unfit to survive; indeed, that they are, in effect, scavengers.

"In summing up his findings, liberally implemented with chemical terms and tables, he voices the opinion, and certainly with forceful logic, that our deficiency diseases, so-called, including orthopedic troubles, are very largely the result of mineral starvation."

Whoever it was that wrote this article about Hensel's book experimented himself on our Pacific Coast with pulverized granite from the Cascade mountains and verified all that Hensel claimed, including the elimination of plant parasites.

Undoubtedly Hensel, like so many other scientific pioneers, lived ahead of his time. Now, however, that mineral deficiency diseases of plants and animals are being recognized, it is time that those interested in finding new markets for rock products sit up and do a little thinking and a little scientific experimenting. It will, of course, eventually come down to a question of economics—whether it is better and cheaper to apply rock dust or concentrated forms of the mineral elements to the soil. Since it is recognized that the mineral balance of soils is a delicate thing to adjust when using concentrated fertilizers, and that too much of some elements are detrimental or toxic to plants and animals, it would seem that Nature's own balance as found in the igneous or bed rocks of the Earth is a safe soil mixture. All forms of life and vegetation have been evolved and adjusted to this balance of Nature's bed rocks, and the farther we depart from it, the more ills of life crowd upon us.

Nathan C. Rockwood

NEWS ABOUT PEOPLE

Promoted to Supt.

DONALD E. KOCH, formerly chief assistant chemist at the Standard Portland Cement Co., Painesville, Ohio, has been made permanent superintendent of the Reliance mill of the Giant Portland Cement Co., Egypt, Penn. He succeeds O. D. Havard, who resigned. Mr. Koch has been identified with the cement industry since 1923, when he started as a sample boy in the laboratory of the Medusa Portland Cement Co., York, Penn. In 1929 he was promoted to assistant chief chemist at the Crescent plant of Medusa, in Wampum, Penn. Mr. Koch became associated with the Standard Portland Cement Co. in 1932. He left that company to accept a position as chief chemist at the Giant Portland Cement Co.

On Technical Staff

STEPHEN W. DERBYSHIRE, ceramist, has been appointed to the technical staff of Battelle Memorial Institute, Columbus, Ohio, and assigned to its division of ceramic research. Mr. Derbyshire, who holds a Bachelor of Science degree in ceramic engineering from the University of North Carolina, was formerly associated with the Mexico Refractories Co., Mexico, Mo. He is a member of the American Ceramic Society and Keramos.

Employed as Engineer

C. HERBERT REYNOLDS is employed by Basic Refractories, Inc., Toiyabe, Nev., as engineer.

New Superintendent

LEE J. SMITH is superintendent of the crushed stone plant operated by Smith Engineering and Construction Co., Pensacola, Fla., where a granite aggregate for air field and access road construction is being produced.

Assistant Manager

NORMAN TRACY, for several years associated with the Salmon Bay Foundry Co., Seattle, Wash., has been appointed assistant manager of the Bremerton Concrete Products Co., Bremerton, Wash. The announcement was made by the firm's secretary, F. M. Kettenring, who also heads the Graystone Concrete Products Co. in Seattle. President and manager of the Bremerton Concrete Products Co. is Mott Rieke, who is also actively interested in the Bremerton Ready Mix Co., and the Bremerton Sand and Gravel Co. W. F. Paddock of Graystone Concrete products is also associated with the three Bremerton companies.

Elected Vice-President

C. M. HOWARD, president of the Concrete Pipe Association, Seattle, Wash., has been elected second vice-president of the Pacific Northwest Sewage Works Association.

Plant Manager

HERBERT H. LAUER, about whom a brief personal item appeared in the June issue of ROCK PRODUCTS, was superintendent of construction of the

Herbert H. Lauer

cement plant built by the United States Government in 1938 on the Island of Puerto Rico at Catano, near San Juan. Upon returning to the United States Mr. Lauer became a consulting cement plant engineer. He is now plant manager of the Glens Falls Portland Cement Co., Glens Falls, N. Y.

Elected President

T. M. STUART, a director of the Yosemite Portland Cement Co., Merced, Calif., since 1934, has been elected president and general manager of the company, succeeding A. Emory Wishon who has resigned. Mr. Wishon will remain on the board and continue as a member of the executive committee. He has been president of the company since its beginning in 1924.

In the Services

SAMUEL H. BRICKER of the Bellefonte Division of Warner Company, Philadelphia, Penn., is an Ensign in the U. S. Navy.

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CALVIN C. PURNELL, personnel manager, Bellefonte Division, Warner Co., Philadelphia, Penn., son of G. I. Purnell, sales manager, recently enlisted in the U. S. Naval Reserve.

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H. A. COLEMAN, special representative, Missouri Portland Cement Co., Kansas City, Mo., is now in the U. S. Army.

Made Assistant Superintendent

ALLEN MOORE, head chemist at the San Juan cement plant of the Pacific Portland Cement Co., San Francisco, Calif., is now assistant to Frank Parker, superintendent of the company's plant at El Centro. Mr. Moore has been in charge of the chemical laboratory at the Mission plant since it was opened.

Re-elected

ERNEST W. MCCALL, secretary of the Tarbox-McCall Stone Co., Findlay, Ohio, has been re-elected president of The Crushed Stone Association of Ohio. E. V. ANSBACH of Toledo, was re-elected vice-president, and DR. WILLIAM GUITTEAU, also of Toledo, was re-named secretary.

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LEON A. BEEGHLY, president of the Standard Slag Co., Youngstown, Ohio, has been re-elected a director of the American Business Men's Research Foundation of Chicago.

Named Superintendent

W. C. LEE has been made superintendent of the State of Virginia Lime Grinding Plant, Staunton, Va., replacing M. L. Royster.

New Hillside Officials

JAY L. HENCH has retired as president of the Hillside Fluorspar Mines, Rosiclare, Ill. Operation of the mines was taken over recently by the Inland Steel Co. through purchase of all the capital stock of the company. New officers of the Hillside company will be: President, Clarence B. Randall, who is vice-president of Inland; vice-president, P. D. Block, Jr., assistant vice-president of Inland; secretary, J. H. Morris, Inland's secretary; treasurer, W. D. Truesdale, treasurer of Inland; manager of operations, A. J. Cayia, general superintendent of the Inland Lime and Stone Co., Manistique, Mich., and, manager of sales, Gordon W. Hughes, sales manager of Inland Lime and Stone Co. H. W. Hurst will continue as general superintendent at the company's operating office in Rosiclare.

The Hillside Fluorspar Mines was founded in 1919 by the late G. H. Jones, a co-founder and large stockholder in Inland Steel Co. Since his death in 1941 the Hillside stock has been held in trust by the First National Bank of Chicago.

Acting Superintendent

J. C. ANDREWS, plant engineer at the Superior, Nebr., plant of the Ideal Cement Co., for the past two years, has been appointed acting superintendent of the plant. Mr. Andrews has been in charge of operations at the plant since the death of L. M. Mayhew several months ago.

Returns to Job

M. A. SWAYZE, director of research, Lone Star Cement Corp., has returned to his job after six months' leave of absence, during which he did special work for Singmaster & Breyer, consulting engineers, on the Pidgeon process for magnesium recovery from dolomite.

W.P.B. Appointments

VINCENT P. AHEARN, executive secretary of the National Sand and Gravel Association, has been appointed a member of Industry Committee No. 59 for the Stone, Clay, Glass, and Allied Industries, Wage and Hour Division, U. S. Department of Labor. Other members are W. M. Palmer, president of Dixie Lime Products Co., Ocala, Fla.; J. A. Rigg, vice-president and general manager, Acme Limestone Co., Fort Spring, W. Va.; Fred E. Smith, general superintendent, The Harris Clay Co., Spruce Pine, N. C.; J. Frazier Glenn, vice-president, Georgia Talc Co., Inc., Asheville, N. C.

Manager Chemical Works

E. D. POWERS, author of the series of articles on Dust Collection appearing in ROCK PRODUCTS, has been promoted to operating manager of the

E. D. Powers

Welland Chemical Works. Mr. Powers will welcome correspondence in regard to his articles. Others undoubtedly have operating experience that may be contributed to the series.

Medusa Appointments

EDWARD S. ROGERS, JR., has been appointed general sales manager of the Medusa Portland Cement Co., Cleveland, Ohio, to fill the vacancy caused by the recent death of Andrew T. McCormack. Mr. Rogers had been assistant general sales manager. L. E. DE CAMP, a member of the sales staff, has been advanced to assistant general sales manager. HARRY G. NEVINS has been appointed district sales manager in Chicago.

President of New Company

C. S. FREUND is president of the Cement Tile Corp., a newly formed company to manufacture and install precast concrete roof and floor slabs. It is owned and operated by a group of key men associated with the Federal-American Cement Tile Co. for over 25 years. Other officers include: L. J. Wilhartz, vice-president; A. X. Isherwood, secretary and sales manager; V. E. Baird, treasurer and chief engineer; and O. R. Pritchett, assistant secretary and plant manager.

W.P.B. Resignation

W. H. HODGES of Atlanta, Ga., E. RAY RANKIN of Statesville, N. C., and JOHN GARVEY of Washington, D. C., have resigned from Industry Committee No. 59 for the Stone, Clay, Glass, and Allied Industries, Wage and Hour Division, U. S. Department of Labor.

Director-at-large

STANTON WALKER, director of engineering and research, National Sand and Gravel Association and National Ready-Mixed Concrete Association, Washington, D. C., has been elected director-at-large of the American Concrete Institute.

Awarded Degree

JOHN VAN NOSTRAND DORR of The Dorr Company, New York, N. Y., was recently awarded the honorary degree of Doctor of Science by Columbia University, in recognition of his contributions to metallurgical, sanitary and chemical engineering as an engineer, inventor and administrator. Mr. Dorr has been the recipient of a number of other honorary degrees. In 1914 Rutgers University, from which he graduated in 1894, made him a Master of Engineering and, in 1927, presented to him the honorary degree of Doctor of Science. In 1940 both the South Dakota School of Mines and the Michigan College of Mining and Technology conferred upon him honorary degrees of Doctor of Engineering.

From painting by Karl Anderson

John Van Nostrand Dorr

Remove Tramp Iron With Stationary Magnet

ADJOINING the yard of Parker Bros. & Co., Houston, Texas, is a plant for grinding oyster shells for chicken

Magnet installed at head of conveyor to remove tramp iron from oyster shells

feed. Parker Bros. & Co. supply the shells which are delivered to the grinding plant by a belt conveyor. At the head of this conveyor is a stationary magnet for removal of tramp iron. The magnet is mounted above the belt as shown in the illustration. It does a good job and is very simple to install and operate.

Air Receiver Hook-Up

AT A LARGE EASTERN fluxing stone operation the main sources of air are two stationary type, IR compressors each driven by a 75-hp. G.E. motor. While the compressor unit is of the stationary type it is so installed that it ranks in the portable class as the house and compressor foundation are on skids. The two air receivers are mounted horizontally and on skids as shown in the illustration. The two receivers are connected to a header by suitable valves and flanges so that one compressor can be in operation

Compressor houses and air receiver tanks mounted on skids for convenient removal to another site

while the other is being moved, if so desired. The tanks are each provided with air safety valves and bleeders for removing accumulated oil.

Pipe Pusher

THE CHOCTAW CULVERT AND MACHINERY Co., Memphis, Tenn., has one of the largest concrete plants in the South. They recently got a large order for 9-ft. diameter pipe, but about the time they started filling the order, the rains started. The large yard at 1184 Tupelo street soon became so muddy it was impossible to roll the 16,500-lb. pipe segments to the curing yard, so N. L. Gonyaw, superintendent hit upon the novel idea of welding a truck axle to the front end of an Allis-Chalmers tractor. The old solid rubber wheels of the truck then could be pushed against the large pipe as shown in the illustrations.

Rain or shine, the tile can now be pushed about the yard. The device is also used for loading trucks. Using the tractor two of the pipe units can be loaded on a semi-trailer in about five minutes. This includes time required to build the ramps.

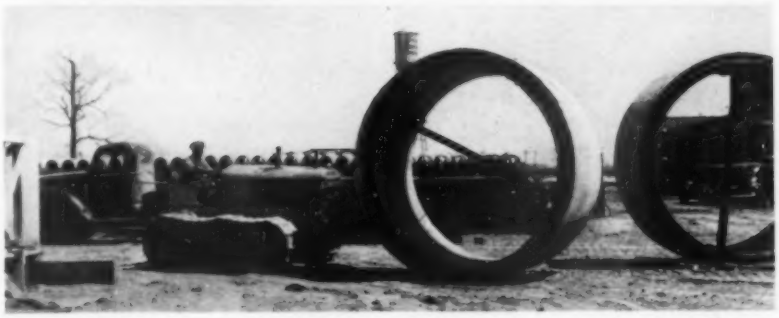
Screening Oil Supply

By W. F. SCHAPHORST

AN EXCELLENT "pipeless strainer" was recently shown to me by an engineer friend who has given me permission to describe it.

An oil strainer as commonly made consists of a perforated pipe covered with a fine mesh wire cloth. The perforated pipe gives the strainer the necessary rigidity to resist collapse and the wire cloth keeps out the undesirable solids, lumps, dirt, etc.

This engineer decided that the perforated pipe would be unnecessary, provided he could find a wire cloth of sufficient stiffness to serve the purpose alone, and that is what he did.



Above: Tractor equipped with pusher wheel rolling pipe up incline to semi-trailer. Below: Close-up showing old truck wheel and axle assembly welded to tractor

He secured a rugged, durable, fine mesh monel metal wire cloth and succeeded in making a very satisfactory strainer out of it—much superior

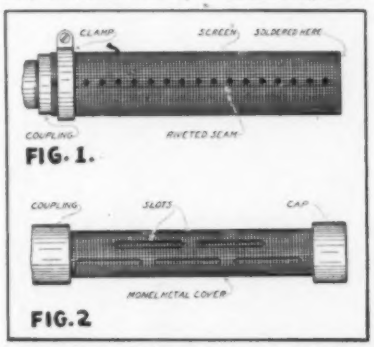


Fig. 1—For ordinary use. Fig. 2—For high pressure a slotted pipe is advisable

to the old-fashioned type. Monel metal solders readily, can be fastened into place easily and securely and is cleaned quickly. A perforated pipe not only retards flow but costs additional money. Besides the total open area through which the oil can flow is much greater without the perforated pipe than with it.

My friend tells me that the idea "makes a hit" with everybody who sees it. I can see no reason why it should not be standard practice for all oil supply inlets. It is a good idea and is certainly based on sound engineering design.

Concrete Belt Conveyor Supports

A CEMENT PLANT in the South is now using a long belt conveyor system to bring limestone and shale to the plant. Conveyors follow the

Belt conveyor supported on substantial concrete piers

contour of the ground, more or less. A low frame building covered with corrugated iron protects the belt from wind or other inclement weather. Note the sturdy and well built concrete piers supporting the conveyor. Care in such details of design which if ably carried out insure accurate alignment of the belt, and in the case of long field conveyors where close and frequent inspections may be impractical are of double importance. These are only a few of the factors that give low operating costs.

Your Idea May Bring You $5.

Five Dollars will be paid for all acceptable ideas for "HINTS and HELPS"

Ideas for meeting practical problems, safety devices, conservation measures, methods of improving efficiency, etc., will be accepted and paid for, subject to the approval of the editors of ROCK PRODUCTS. Send snapshot or drawing with each idea submitted to ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, 6, Ill.
Cash your ideas in at $5 each. Profit by reading the ideas submitted by others.

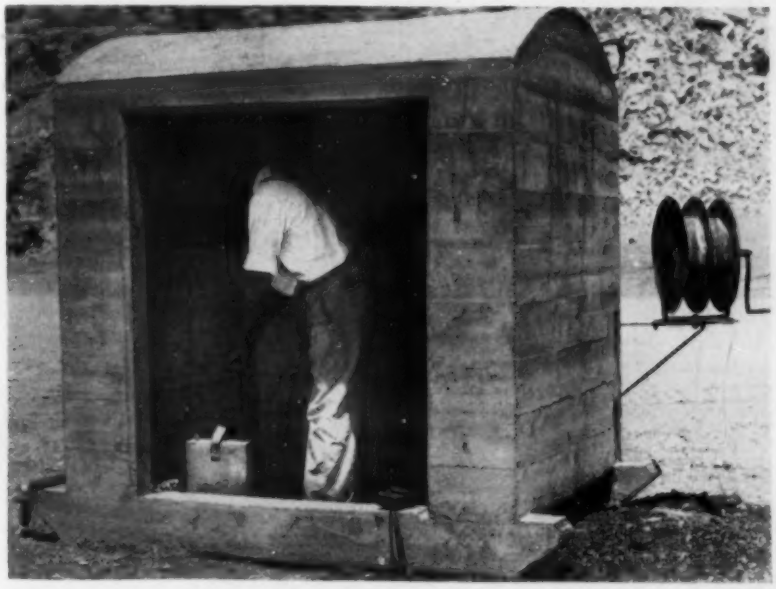
Safety Shelter for Blasting

By RAYMOND COY
Supt., New York Trap Rock Corp., Stoneco, N. Y.

IN THE ACCOMPANYING ILLUSTRATION is shown a concrete portable blasters' shelter which was designed to improve secondary blasting procedure and as a safety measure. At the present time two such shelters are in use.

These shelters can be pulled to the section of the quarry where they are needed. Since the shelters can be used within a comparatively short distance from the face, much shorter wires are required with the result that much time is saved in checking circuits.

The reel shown attached to the shelter accommodates two sets of lead wires which are reeled in and inspected after every blast. Reinforcement for the concrete consisted of old screen cloth from vibrating



Concrete blasters' shelter which may be pulled to convenient point in the quarry for the blasting operation

screens. Skids have steel plate runners which curve up at the ends. At one end, the steel runners are welded to an angle cross bar to which rings are attached for pulling the shelter.

Strut Supports Pipe Being Cured

CONCRETE PIPE, 9 ft. in diameter, must have plenty of steel reinforcement. The Choctaw Culvert and Machinery Co. of Memphis, Tenn., use four liners of No. 1 wire placed on 2-in. centers. After 24 hrs. the forms are removed and in 48 hours the cast pipe can be turned over using their Universal crane. A strut is then placed inside the pipe as shown in the illustration and the pipe rolled to the curing yard by means of the Allis-Chalmers tractor with the wheel-roller. After seven days in the curing yard the strut is removed as all danger of failure is past.

Strut placed within large diameter concrete pipe serves as a support during 7-day curing period

Radio on Dredge Boats

HOUSTON, TEXAS, is proud of its inland harbor and during these times it is a busy place. Large tonnages of sand, gravel, oyster shells are moved into this harbor. Especially is this true of oyster shells which are used for road building, in concrete mixes, for manufacture of portland cement, lime, etc. One of the largest producers in the district is Parker Bros. & Co. Their oyster shell dredges may be as far as 50 miles from the Houston office, and to keep contact with the dredge masters and tow boat captains, a two-way radio set has been installed. No difficulties so far have been encountered with governmental communications departments. The illustration shows the sending and receiving station located in the bayou that acts as a channel for their large fleet of barges and tug boats.

Above: Tug boats, barges and dredges of Parker Bros. & Co., keep in touch with the main office by two-way radio system. Below: Sending and receiving antenna on small tower located on wharf

Simple Culvert

A WELL WORN PATH connects the plant and quarry at a Southern cement plant. The distance is a little over a mile, and there are several small brooks to cross. Some thoughtful pedestrian evidently got tired jumping these brooks going to and from the quarry. He simply knocked the heads out of some old and otherwise useless barrels, weighted them down with rocks and let the barrels serve as a foot bridge.

Old steel drum, weighted with rocks, serves as foot bridge

Wire Screen Walkway

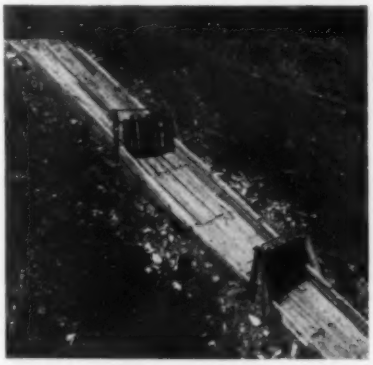
AT A SOUTHERN CEMENT PLANT belt conveyors are used to transport the limestone and shale to the plant. The installation is well over a mile long.

Old screen wire makes a safe walkway along belt conveyor

Where the conveyor system is elevated off the ground any appreciable distance steel walkways flank the conveyor. The floor treads are made up of light wire screening. Other operators could adopt this idea using old or partially worn out wire screens.

Brake Stone Fall

AT THE BATESVILLE WHITE LIME Co.'s plant at Batesville, Ark., considerable limestone is sent to chemical, sugar, and bauxite refineries. Some of this stone is loaded by a long chute. To brake the fall of the stone,



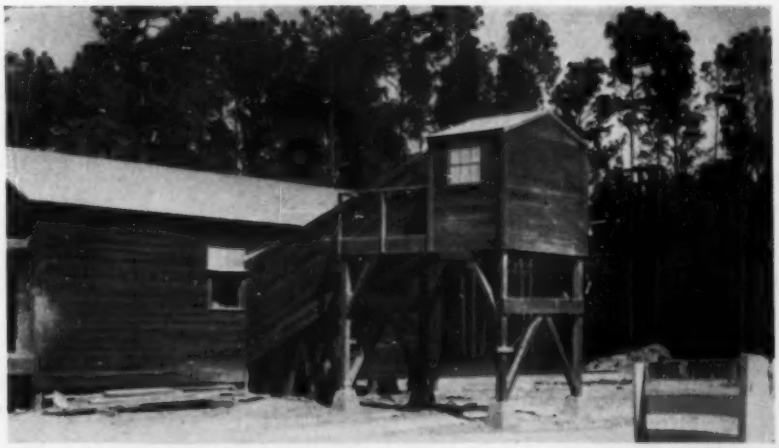
Sections of steel rail suspended in chute trough brake the fall of stone

fingers of old steel rails (and similar heavy iron junk) are suspended as shown in the illustration. There are two of these sets of fingers.

Fire Prevention for Field Conveyors

USE OF BELT CONVEYORS for long distance haulage is increasing throughout the United States. After the war, due to many new developments in the manufacture of rubber conveyor belt, field conveyors will probably become more common as they can show costs (per ton mile) that are low.

If a field conveyor system goes through a heavily wooded section some provisions must be made for fire protection, for obviously a brush or forest fire might destroy the entire assembly. Experience of others in the timber country has shown that the best way to protect property from brush fires is to clear away all brush from the property to be protected. At this southern cement plant installation, the owners evidently were not taking chances as they have largely eliminated the possibility of fire by removing all brush from alongside the field conveyor system.



Above: Simple batching plant. Electric hoist moves hopper up incline to top where it is opened automatically by a tripping device. Below: Hopper with its load ready to move up incline

Simple Batching Plant

PARKER BROS. & Co., Houston, Texas, has a large ready mix plant and a fleet of Rex mixer trucks. Most of the business is handled from the main, down town yard located at 5303 Navigation boulevard. Recently they had occasion to erect a batching plant at one of their suburban sand-gravel-shell bunkers, so Sid Clark, a field engineer of this company, built one. Trucks load sand and gravel at the nearby bunkers, then pull over to the cement loading bunkers. Here a hopper has been provided that is loaded by dumping cement sacks into it. The hopper runs into the storage building on an inclined track and is designed so that the men will not have to lift the sacks any higher than necessary. The hopper is then pulled up the incline by an electric hoist and when it reaches the dumping point, the bottom of the hopper automatically opens (by means of a tripping device) and the cement falls into the mixer trucks. This simple and cheaply erected plant filled a need for a small plant where a larger batcher was unwarranted.

Brush cleared away from long belt conveyor reduces possibility of damage from fires

Cement Company Back of Alumina Project

VOLUNTEER PORTLAND CEMENT CO., Knoxville, Tenn., and the American Nepheline Co., are reported to have formed a joint operating company to develop an alumina deposit and erect a plant which it is expected will cost $2,650,000. The plant will be erected in North Carolina. According to Ross Hanahan, president of Volunteer Portland Cement Co., funds will be authorized by the Reconstruction Finance Corporation. Clay from Aiken county, furnished by the American Nepheline Company, and limestone and marl from the Four Hole swamp of Dorchester and Orangeburg counties will be used to make alumina, which is aluminum oxide. Five tons of limestone and three tons of clay will be needed to produce one ton of alumina, and two tons of this will be necessary for a ton of the metal aluminum.

Temporary Shut-Down

MANITOWOC PORTLAND CEMENT CO., Manitowoc, Wis., has shut down its cement plant with bins full. Operations will be resumed when surplus stocks of cement have been used. Nearly all the employes are busy in war plants in the city. Machinery will be overhauled so that operations can be resumed on short notice. This plant has been in continuous operation since April, 1942.

Convert from Gas to Coal

LEHIGH PORTLAND CEMENT CO. is contemplating the conversion of three of the five kilns at the Iola, Kans., plant from gas to coal firing. This action was contemplated in anticipation that the natural gas division of the War Production Board will order the cement companies to cease burning natural gas, probably by October 1. Last Fall such an order was issued but was later rescinded. The company therefore decided to change to coal burning if the necessary priorities could be obtained for the equipment. It is expected that the priorities will be granted.

Big Aggregate Order

RIVER BEND SAND AND GRAVEL CO., Salem, Ore., has been awarded a contract of more than $100,000 to construct an airport apron and other facilities in Ada county. This information was released by Army engineers office of the Boise-Pocatello area.

Ohio Road Contracts

DIRECTOR H. G. SOURS of the Ohio Department of Highways has announced award of contracts for the following road projects: Huron county, length 7.98 miles, to cost $100,100 awarded to Ohio Road Improvement Co., Columbus, Ohio; Medina county, length 6.76 miles, to cost $115,700, awarded to Ohio Road Improvement Co., Columbus, Ohio; and Ashland, Crawford, Huron, Medina, and Wayne counties, bituminous treatment, to cost $120,275, awarded to Northeastern Road Improvement Co., Willoughby, Ohio.

Building Tunnel Kilns

CLEVELAND QUARRIES CO., Sterling grinding division, Tiffin, Ohio, is receiving bids for the construction of two factory buildings, one of which will house a 170-ft. tunnel kiln, more than doubling the plant's capacity. The company manufactures grinding wheels and abrasives.

International Minerals Expands

INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago, Ill., has expanded and diversified its line of products under the impetus of war demands. Its most recent acquisition has been the purchase of Amino Products Co., Detroit, Mich., producing products entering into the food trade. The parent company's phosphate operations center in Tennessee and Florida. The new Peace Valley Mine was completed in Florida last year, and is now producing at high levels to supply domestic and export needs. This plant replaces several smaller units that had become exhausted and, by concentrating productive capacity in one large plant, has been responsible for lowering costs and raising efficiency of output. Early in 1942, the company merged Union Potash & Chemical Co. with the parent organization. It is also producing magnesium in two plants, one in Texas and one in New Mexico.

Road Funds to Flooded States

BETWEEN $5,000,000 to $7,500,000 of impounded federal aid highway funds have been released by President Roosevelt for emergency road and bridge repairs in eight middle western states ravaged by recent floods. The States will be required to match the federal funds. The President's action freed accrued balances previously allocated to the States but impounded in 1941, when all nonessential road construction was halted on account of the war. The States mentioned are Illinois, Indiana, Missouri, Kansas, Nebraska, Oklahoma, Arkansas, and Mississippi.

Highway Stone Contract

A REPORT from Colfax, Wash., states that county commissioners have awarded to F. H. De Atley & Co., Lewiston, Wash., a $76,500 contract for the crushing of 45,000 cu. yd. of rock to be used for road maintenance and emergency construction. Crushed rock will be stockpiled at Thera, Wash.

Cut Atlas Production

UNIVERSAL ATLAS CEMENT CO., Hudson, N. Y., plant will reduce production to two kilns which will be operated to the end of 1943 and into 1944.

Prairie Du Rocher, Ill., plant of Columbia Quarry Co., during the recent floods

Pass Superhighway Bill

THE ILLINOIS LEGISLATURE has passed a bill for the establishment of a state-wide super-highway agency. This will probably be followed by repeal of the 1941 Cook County super-highway law. Governor Dwight H. Green is linking the super-highway bill with his program to provide employment for veterans of World War II. A fund of $70,000 is provided immediately for preliminary work by a commission of five men. Plans for toll highways drafted by the commission must be approved by the Governor before the commission may issue bonds to pay 5 percent interest. Automatic check on the commission is the economic fact that the bonds would find no market unless the super-highway plan was financially sound and indicated that sufficient tolls would be collected from motorists and truckers to meet interest and retirement requirements.

Buys Fluorspar Mines

INLAND STEEL CO. has purchased the Hillside Company fluorspar mines at Rosiclaire, Ill., which it is planning to develop for extensive wartime production. More than 90 percent of the fluorspar produced in the United States comes from Hardin and Crittenden counties in Illinois and Kentucky, respectively, on opposite sides of the Ohio river. The Hillside company was founded in 1919 by the late G. H. Jones who controlled and operated the mines until his death in 1941. Since then the stock had been held in trust by the First National Bank of Chicago. Mr. Jones also was the founder of Inland Steel Co., and the steel firm has been the most important customer of the fluorspar mines. It is believed that the Hillside company will continue to be operated as a separate unit without any change in general policies.

Boost Mica Output

MICA COMPANIES will benefit from a new schedule of buying prices, optional with producers, announced recently by the Colonial Mica Corporation, agent of the Metals Reserve Company, and is federal-government sponsored. The new schedules contain inducements aimed at greater production of small sizes, most critically needed at this time and came as a result of a series of studies and investigations which have been under way for some time. Much of the sorting and grading heretofore required before marketing has been eliminated.

Lime Plant Resumes

THE SOUTHWEST LIME CO., Neosho, Mo., which was forced to shut down due to the washout of a gas pipe line caused by flood conditions has resumed operations. Shutdown of the plant for a time threatened to cause a stoppage in production at a large steel mill which uses the lime as a fluxing agent.

Busy in Oregon

M. C. LININGER & SONS, Medford, Ore., has been busy supplying aggregates for a big army camp and air base. The company operates a 50-cu. yd. capacity portable plant for State highway projects, and a permanent plant for maintenance materials having a capacity of 50-cu. yd. per hour. The company produces sand and gravel and also crushed granite.

N.L.R.B. Against Foremen's Union

BY A TWO TO ONE DECISION, the National Labor Relations Board voted to exclude supervisory employes from the provisions of the Wagner Act. In the recent Maryland Drydock Co. case, the Board reversed a previous ruling which extended the act's jurisdiction to foremen of coal mines.

Cement Plants Start Up

SANTA CRUZ PORTLAND CEMENT CO., Davenport, Calif., is reported to have started up two new kilns and all of the old kilns are in operation.

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PETOSKEY PORTLAND CEMENT CO., Petoskey, Mich., has resumed production after the winter and early spring closing and repair season. About 275 men will be employed.

Shut Down Quarry

EYERMANN CONTRACTING CO., St. Louis, Mo., has shut down its quarry until new business warrants operation. J. Eyermann is president of the company.

Sales and Uses of Lime

BUREAU OF MINES reports that total sales of lime in 1942 were 6,076,000 tons, only about 3000 tons below the record volume of 1941. Total quicklime sold in 1942 gained 7 percent over 1941, whereas sales of hydrated lime declined by one-fifth. Stoppage of all construction not essential to the war program in April, 1942, resulted in a falling-off of one-third in sales of building lime from 1941. Compensating for this decline, sales of chemical lime and of dead-burned dolomite increased respectively 6 and 15 percent over the 1941 volumes. Increased demand for chemical lime was due largely to greater consumption as flux in steel making, in the purification of bauxite for aluminum smelting and in the manufacture of calcium carbide. Consumption of agricultural lime declined only slightly from that in 1941.

TABLE 1—LIME SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1941-42.

	1941		1942 (Preliminary)	
	Short Tons	Value	Short Tons	Value
By type				
Quicklime	4,489,257	$30,586,364	4,800,000	$34,116,000
Hydrated lime	1,590,159	12,354,798	1,276,000	10,199,000
Total lime	6,079,416	42,941,162	6,076,000	44,315,000
By use:				
Agricultural:				
Quicklime	161,063	866,721	172,000	911,000
Hydrated lime	221,664	1,520,324	198,000	1,423,000
Total	382,727	2,387,045	370,000	2,334,000
Building:				
Quicklime	285,271	2,593,799	181,000	1,683,000
Hydrated lime	780,328	6,665,319	519,000	4,574,000
Total	1,065,599	9,259,118	700,000	6,257,000
Chemical and industrial:				
Quicklime	2,973,036	18,014,672	3,218,000	20,704,000
Hydrated lime	588,167	4,169,155	559,000	4,202,000
Total	3,561,203	22,183,827	3,777,000	24,906,000
Refractory (dead-burned dolomite)	1,069,887	9,111,172	1,229,000	10,818,000

Dragline Bucket for Tough Service

DANIELS - MURTAUGH CO., Cedar Rapids, Iowa, has designed and is now selling a dragline bucket known as the Dragliner. It is being built by

Sturdy dragline bucket has replaceable manganese steel lips to give support to the arch at its base

the Universal Engineering Corporation, Cedar Rapids, Iowa.

The combination bumpers and drag chain hitches are features of this bucket. When the empty bucket is dropped, it lands on the bumpers which are designed to take this shock. In this way the arch, which is back of the bumpers, is protected. These bumpers also shield the drag hitches so that the bucket does not fall on them, resulting in a longer service life for the hitches.

Weight is said to be well distributed, permitting a low hitch. As a result, this bucket takes hold in tight material without a tendency to stand on its nose.

Replaceable manganese steel lips give support to the arch at its base. The ends of the arch fit into recesses in the lip casting. The bumpers firmly tie lip, arch and body together. Lips with either four or five teeth are available. Either a one-piece tooth or two-piece tooth with renewable point is available. Both types are keyed to lip in the customary manner.

Portable Road Mix Plant

IOWA MANUFACTURING CO., Cedar Rapids, Iowa, is now manufacturing a portable asphalt plant with a capacity of 3000 to 4000 lb. of hot or cold bituminous mix per batch. The unit is easily portable by truck and can be erected quickly.

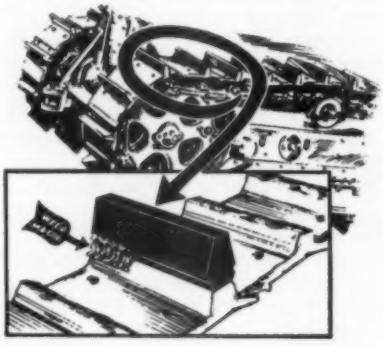
Starting with the aggregate drying unit, which is mounted on wheels with pneumatic tires, aggregate is carried by the hot material elevator, enclosed in dust-proof housing, to a Cedarapids - Symons, double - deck horizontal vibrating screen. Graded aggregate falls into a three-compartment storage hopper, which has a capacity of six batches. Hopper and sizing screen are totally enclosed in steel dust-proof housing. From hopper, proper proportions of material are dumped into an aggregate batcher, which is mounted on dial indicating, springless scales. Steam-jacketed asphalt batcher also is mounted on scales. Batchers empty material into a 3000 or 4000 lb. twin-shaft, steam-jacketed, all-steel pug mill.

Electric, gasoline, or Diesel power can be used. On electric drive plants, each unit is powered by an individual electric motor. This eliminates countershafts, bearings, chains and sprockets, permits simplicity and faster assembly and knock-down. Controls for all operations, including bin-gate levers, batchers, gate levers, pug mill discharge lever, and motor push-button switches, are centrally located on the operator's platform.

Knocked down into three units, each mounted on pneumatic tired wheels, this plant can be transported by trucks at 30 to 40 miles an hour. On location the plant can be erected by a small crew, and without the aid of a crane, in 12 to 18 hours.

Salvage Old Worn Grouser Shoes

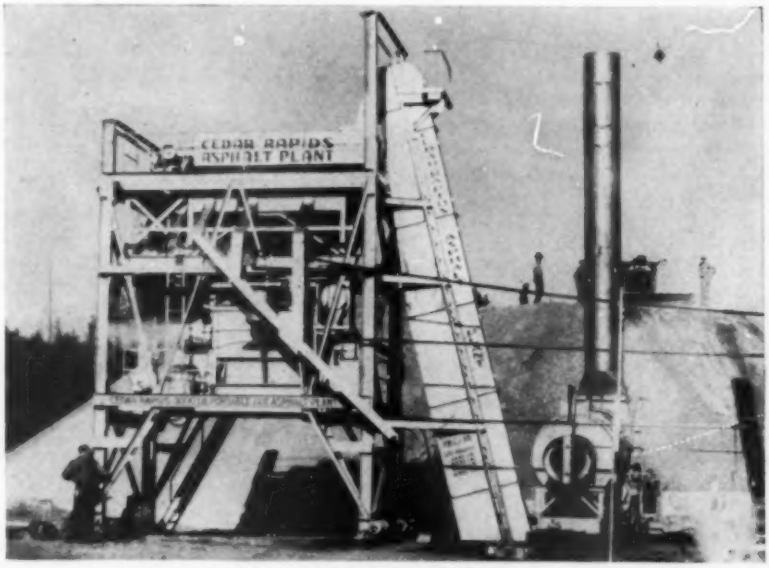
ALLIED STEEL PRODUCTS, INC., Cleveland, Ohio, has announced an improved tractor grip-lug which is said to offer a quick, efficient method of



Grip-lug for tractor which can be quickly welded to grouser-shoe

making repairs and getting tractor equipment back into service.

With the improved Bulldog brand tractor grip-lug, it is unnecessary to tear down the track assembly and replace the worn grouser-shoes with new parts. This is accomplished by



Bituminous mix plant which can be rapidly erected and taken down at the job site

welding on to the old grouser-shoe a specially designed steel bar with a groove and bevel to facilitate laying welding bead along the edge which holds the bar and the grouser-shoe together as in a vise. The material is a special analysis work hardening steel which gets harder and tougher with use, and often outlasts the original grouser.

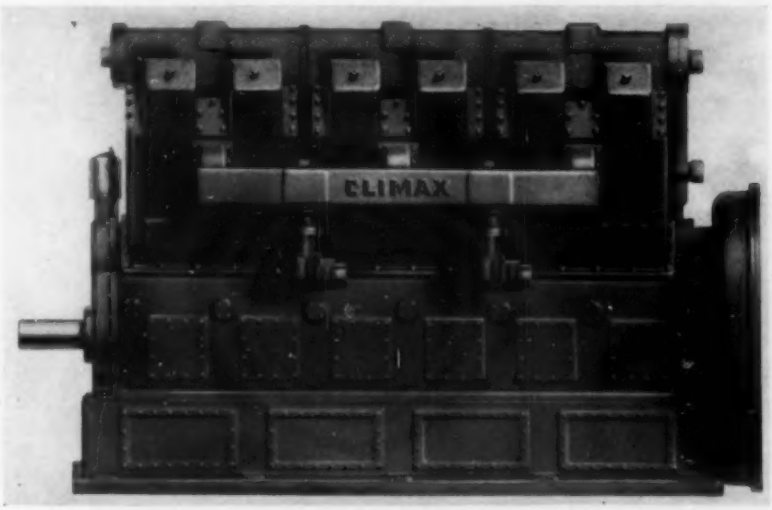
Care and Maintenance of Conveyor Belting

THE B. F. GOODRICH CO., Akron, Ohio, has issued a 24-page booklet on the "Care and Maintenance of Conveyor and Elevator Belting." Typical subject headings illustrate the information available: Belt Wear at Loading Points, Skirt-Boards, Making Conveyor Belts Run Straight, Belt Wear Due to Defective Idlers, Excessive Tension, Hazards to Portable Conveyors, How to Install Conveyor Belts, Elevator Belts, etc.

All-Purpose Gas Engine Uses Low-Cost Local Fuels

CLIMAX ENGINEERING CO., Clinton, Iowa, has announced its V-12 Blue Streak engine. It has a normal speed range of 600 to 1200 r.p.m., and a brake horsepower of 435, and has been designed to operate machinery for rock drilling, large pumps and compressors, and mining and construction equipment. The unit, with suitable generators, offers a low cost means of generating electric power.

The engine will deliver peak power on natural gas, butane, gasoline or other fuels. The change-over may be quickly made with standard, outside located accessories. It has dual carburetion and each cylinder has two spark plugs. The specially shaped combustion chamber is said to assure maximum turbulence for perfect combustion. It is available in two bores: Model V-335, 6½-in. bore and 7-in. stroke which develops 375 hp. at 1200 r.p.m., and Model V-390 with a 7-in. bore and 7-in. stroke that develops 435 hp. at 1200 r.p.m.



Engine which has been designed to use natural gas, butane, gasoline or other fuels with quick change-over accessories

Faster Loading

ATHEY TRUSS WHEEL CO., Chicago, Ill., has brought out an improved model MobiLoader which operates with the Caterpillar Diesel D4 tractor. The new model is said to have increased stability, greater operating range, reduced height to simplify transportation and lower center of gravity. It has a bucket capacity of 1⅛-cu. yd. Digging the load at the front, the outfit travels in reverse to the truck or fill and discharges the material overhead.

Loader has a low center of gravity and a greater operating range

Classifying Viscous Pulp

BIRD MACHINE CO., South Walpole, Mass., described in its literature some recent applications of the Bird continuous centrifugal classifier. In one case about 50,000 tons of tailings from a low grade ore were piling up and it was known that they contained a fair proportion of a vitally needed war material.

It was found that the fraction of the tailings finer than 15 microns contained a sufficiently high percentage of the wanted material to make recovery profitable. The difficulty was to separate these fines from the bulk of the tailings which were in the form of a viscous pulp that was just about pumpable and contained 50 percent solids by weight. A Bird continuous centrifugal classifier handled this material at a classification cost of less than two cents per ton.

Welding

THE LINCOLN ELECTRIC CO., Cleveland, Ohio, has designed an arc welding electrode to speed up welding which is known as "Fleetweld 11". It has been designed for use with the so-called "Fleet-Fillet" technique of arc welding.

This electrode is of the shielded arc type and heavily coated to exclude oxides and nitrides from the weld. It is said to cut down the time of welding, give deeper penetration of metal into the root of the joint, and takes less weld metal when high currents are used, the electrode is advanced to a higher speed and the weld metal penetrates into the corners where the two pieces of metal are joined.

Small Plants Serve Big Jobs

Yazoo-Tennessee Gravel Co. has three plants to produce two sizes of gravel and two sizes of sand at relatively low cost

By WALTER B. LENHART

Left to right: C. A. Hurigen, secretary; J. H. Whigham, president; and W. Himebaugh, engineer for Weymouth Construction Co.

IN THE MEMPHIS, TENN., AREA, the problem of securing an adequate supply of gravel for the many defense projects is becoming serious. A considerable tonnage has been moved in from adjoining states as numerous air bases are requiring a large amount of aggregate. One base used by the Army Ferry Command requires as much concrete as a 90-mile standard highway. At present these air jobs use concrete from 9- to 12-in. in thickness with some reinforcement. But it is expected that in the construction of many bases, the reinforcing rods will be eliminated and straight concrete used. This will require greater thickness of concrete. Blacktop has proved entirely unsuited for runways for the heavy bombers, and in one instance a nearby runway was started, using black-top, but when Army engineers arrived on the job, the blacktop was plowed up and concrete used.

White Station plant. Note dredge operating in background to the left

Loading and batching equipment at White Station plant

To supply the large amount of sand and gravel used, local producers cooperate with each other to help supply the demands, for no single operator has sufficient gravel in his deposit to meet the needs. One job coming up will require 600,000 tons of aggregate to be delivered over a period of three to four months.

During the early Spring months, continuous rain in the Memphis area had held back many construction jobs, so that when the ground dried up it was full speed ahead, and the sand and gravel producers hope to be able to keep up with the demand.

We often wonder when the definition of a "little producer" leaves off and he becomes a "big producer." While plants of the Yazoo-Tennessee Gravel Co. are small, comparatively speaking, their combined output of gravel is probably greater than any in the Memphis area. However, there are other producers who can far outrank them as sand producers. But in gravel they seem to be ahead. Probably one reason for this is that they have not placed all their productive capacity in one plant, but have preferred to build very simple and cheap plants, strategically located about Memphis, and, if the deposit becomes uneconomical, to scrap it and move to another site.

The amount of gravel in a given bank in the Memphis area will probably not average over 20 percent gravel, and that is usually all of small diameter, and rarely one finds a piece of gravel 2-in. in diameter or larger. There are exceptions, for example, the newly built plant of the Yazoo-Tennessee Gravel Co., formerly known as the Raleigh pit, which will process gravel from a bank that has a considerably higher gravel content than the average in this area.

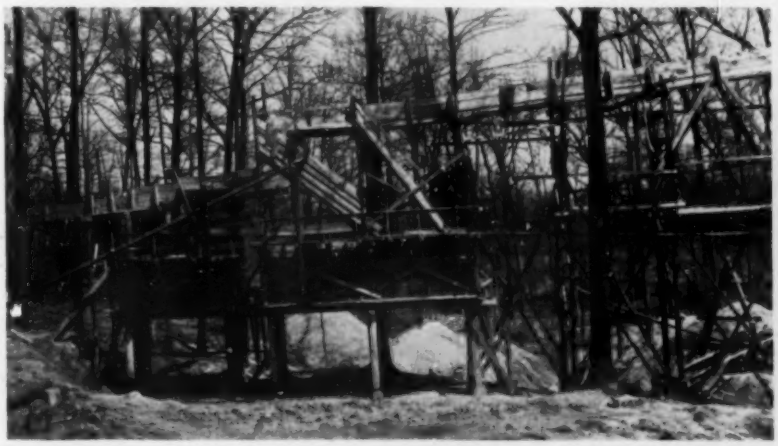
Stripping operations at one of the plants. All of this work is done by contract

James Whigham, president, Yazoo-Tennessee Gravel Co., has been connected with the industry upwards of 20 years and at one time was manager of the Rocquemore Gravel Co., at Montgomery, Ala., but in February of 1941 opened up his first Memphis plant known as the Olive Branch plant. Then in April, 1942, he started his "White Station" plant. Then, when the shortage of gravel became acute, he purchased the old Raleigh pit (renaming it the "Allen Pit") and built his third plant.

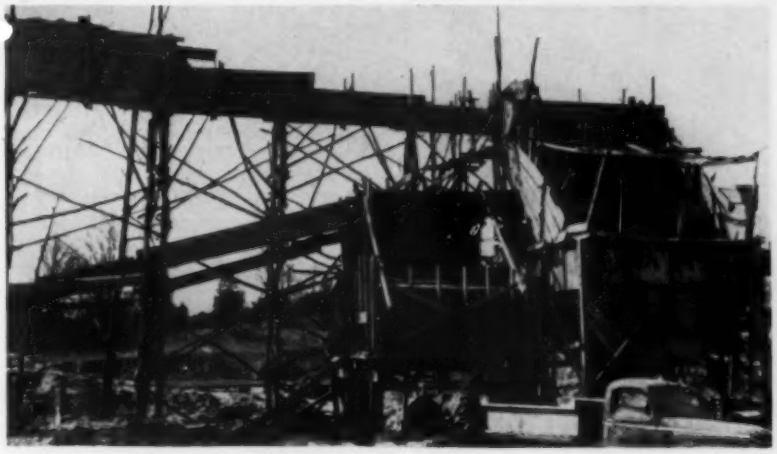
These plants have several things in common; they are built simply, use stationary screens (with one exception), all use truck deliveries, all produce two sizes of gravel and two sizes of sand, and all have a cost of production that compares favorably with that of the larger operators.

"My year around cost per ton compares favorably with that of any larger Southern producer, and I should know, because of my past connection with these large operators," said Mr. Whigham, "and the only place they have it on me is tonnage. My three plants can only produce about 1000 tons per day, so I can't supply tonnage at the same rate they can—but on costs, I can equal theirs."

The three plants are located around the outskirts of Memphis, move easterly in direction, because the owners figured that any future growth of the city would be in that direction. The Olive Branch plant is three miles beyond the Mississippi State Line and southeast of Memphis, yet well within trucking distance to Memphis markets. The White Station plant is three miles almost due east of the city limits and the Allen plant is 3½ miles beyond the city limits to the northwest. As the Mississippi river cuts off growth of Memphis west, the plants of the Yazoo-Tennessee Gravel Co. almost sur-



Allen plant is similar in design to the other two plants, except for the washing launder



Olive Branch plant, showing stationary screens to the right, and to the left is the sand recovery equipment

Special unit at Olive Branch plant for washing and screening odd gravel sizes

round the city, convenient for shipping to points of demand.

Dredge Operation Powered by Diesels

The first plant (Olive Branch) that Mr. Whigham built used American Manganese pumps, 10-in. suction and 8-in. discharge. At the Olive Branch plant, the material is pumped twice so as to aid in the disintegration of clay particles. Both of these Amsco pumps are mounted on suitable pontoons and are driven by Caterpillar D13000 and D11000 Diesel engines through flat belt drives. At the White Station plant, only one pump is used and is similarly driven.

The Olive Branch plant has processed around 300,000 tons of material and there is left some 100,000 tons.

The plants are very simple, as can be seen from the illustrations, but they are going to be the main-stay of Memphis' gravel needs. Two sizes of gravel are produced ordinarily, but if specifications call for a special size, the Olive Branch plant can produce it, for they have installed a double-deck Pioneer vibrating screen at a separate location and plant-run gravel can be re-screened to the desired sizes. This is not often necessary because the market has not been "spoiled" by fantastic specifications. The screen is driven through a LeRoi gasoline engine and Manhattan V-belts.

A fair portion of the company's output is hauled by outside contractors and dealers, although they themselves own 12 trucks—Internationals, Fords and Chevrolets.

Discharge from first pump at Olive Branch plant. Second pump delivers to the plant

The White Station plant is similar in design to the Olive Branch plant. They, however, strip with a Northwest dragline augmented by an RD-8 Caterpillar and dozers, and have an Ensley dragline for loading the Heltzel batcher. The pump on the dredge is a Georgia Iron Works pump. The buckets used on the draglines are Hendrix.

The new plant, which started late in March of 1943, uses a Northwest dragline in conjunction with 6-cu. yd. scraper hauled by RD-6 Caterpillar for recovery of the sand and gravel. This was decided upon because of the shortage of skilled pump men. Mr. Whigham says his output per pump varies greatly with the skill of the pump man and in some instances a skilled pumper can deliver just twice the tonnage of an unskilled workman.

Close-up of the special rescreening unit at Olive Branch plant

Giving gravel a second wash at the White Station plant

At this plant, to offset the scrubbing and washing action he ordinarily gets from his pumps, they have constructed a flume 160-ft. long which has a 12-ft. drop for its length. Water from the settling pond is picked up by an 8-in. pump belted to a Caterpillar Diesel and delivered to the upper end of this scrubbing launder so that the volume of water, launder slope, etc., gives a high velocity flow scrubbing resulting. There are no baffles in the scrubbing launders. It is about 2-ft. wide.

Fresh water at the screens is supplied by a deep well, 5-in. Fairbanks-Morse pump belted to an Allis-Chalmers gas engine.

The stationary screens receive the flow of water and aggregate at the top of the plant, and the gravel falls to wood bins below. The minus ¼-in. material flows over a wooden settling box that is slightly hopper-shaped. The sand settler is about 4- x 10-ft. at the top and 2½- x 10-ft. at the bottom and 5-ft. deep. The sand is drawn out through three 4-in. pipe outlets, each provided with a butterfly-type valve (home-made) with an extended handle for the operator. The valves are simple to make on the job as they have a Hobart electric welder on the premises for this and other construction and repair jobs.

Encourage Mica Production

UNITED STATES MICA MINERS ASSOCIATION is the name of a newly formed organization representing producers of mica in nine states: New Hampshire, Maine, Connecticut, New York, North Carolina, Virginia, Georgia, South Dakota and New Mexico. Hearings are now being held before Senator Truman, chairman of the committee investigating national defense, on charges that the Colonial Mica Corporation is not encouraging the production of mica in step with the demands of the War Production Board goal. The association has been formed to present a united front for the industry which is seeking help to boost production.

Open Old Asbestos Mine

VERMONT ASBESTOS CORPORATION, Eden, Vt., will open the Gallagher mines this Summer, and the crushed rock will be carried over Belvidere mountain to its Eden plant where a chrysotile product will be processed and bagged. Two crushers have been installed, steel towers are being erected, and the mile-long tramway will be in operation in a very short time.

Dallas Office

HUGH A. WALLACE is district engineer of the newly established office of The Asphalt Institute in the Southwestern Life Building, Dallas, Texas, where he will be available to extend the engineering, research, and promotional facilities of the Institute to highway engineers and contractors.

Producing Aggregates for War Projects

Basalt Rock Co., Healdsburg, Calif., plant is supplied raw material by 6-cu. yd. dragline from Russian river and then hauled with 15-cu. yd. bottom-dump Euclids to receiving hopper of the plant

ACTIVITY in the sand and gravel and crushed stone industries is largely centered in those areas where war construction continues in considerable volume. The West Coast, Kansas, Nebraska, and several of the southern States have been the most active. A number of army and navy airports have been extended, and in some cases airport runways have been rebuilt to support heavier type bombers. Many new hospitals are being constructed for the armed services. There is also considerable access road construction, but most of this work has been completed.

Both permanent and movable types of screening and crushing plants have been used on these war jobs, depending upon accessibility to materials and existing plant facilities.

With many projects inaccessible to permanent plants, there has been a tendency toward taking the plant to the job. The illustrations on this page show the two types of plants which have met the challenge of high rates of production for this government work.

Movable plant supplying aggregates for an airbase in Kansas. This a Cedarapids crushing plant powered by a Caterpillar Diesel which has crushed 113,000 tons of stabilized base rock and 72,000 tons of concrete aggregate

PROPORTIONING

Close Control of Raw Material

Kosmos Portland Cement Co., also improves combustion conditions with direct-firing coal pulverizers and a new dust collecting system

By WALTER B. LENHART

For some 38 years, the Kosmos Portland Cement Co., Kosmosdale, Ky., near Louisville, Ky., has been producing cement at this location. Kosmosdale is on the Illinois Central Railroad, the Dixie Highway, and the Ohio River. The plant has a capacity of 4000 bbl. per day, with unusually large storage facilities for limestone, clinker and cement.

The quarry, which is about 27 miles from the plant, is located on the Ohio river. Stone is delivered by steel barges and a Diesel boat to the unloading dock at the plant where it is unloaded by a clamshell rig to truck-loading hoppers. Trucks deliver the limestone, a haul of about 500 yards, to the ground storage piles.

Grinding, both on the raw material and clinker sides, is done with Bradley Hercules mills as preliminaries, and Allis-Chalmers tube mills for finishing. Tube mills are in closed-circuit with Sturtevant separators.

There are six coal-fired kilns, two 8½- x 125-ft. and four 7- x 6- x 100-ft. long. These kilns, driers and auxiliary boiler are fired with individual unit pulverizers made by The Strong Scott Mfg. Co. The plant operates dry.

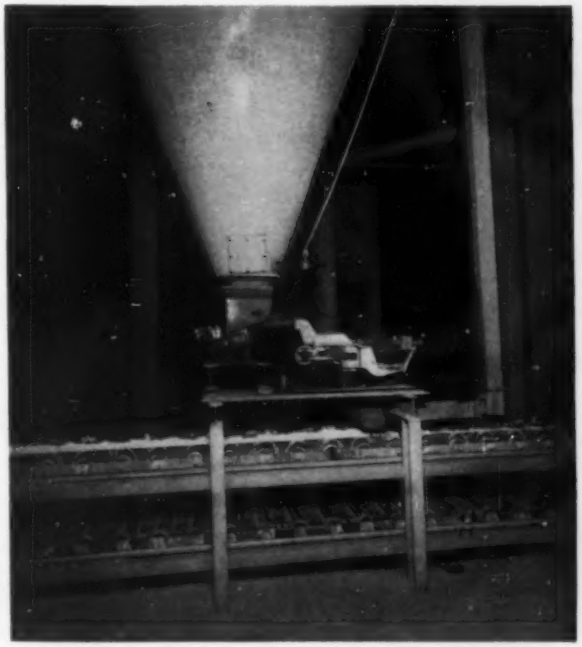
About six years ago, A. C. Brown, plant manager, and T. W. Kraft, plant engineer, made an extensive study of existing dust collecting systems for the kiln gas stream. They visited many plants in the United States and Canada and finally selected the Buell collector system as best suiting their needs.

One striking difference in this installation, and possibly this one difference accounts for its outstanding success, was that the fans originally on the kilns (induced draft) were left in place and in operation and two 125,000 c.f.m. fans were installed on the discharge side of the dust collecting system, so that the added friction imposed by the six banks of dust collectors was more than overcome. The six banks are arranged in two rows. Each fan is driven by a 125-hp. motor.

The doubling up, so to speak, of the capacity available to move the gas stream resulted in better combustion conditions and a marked increase in the capacity of the kilns, so this was an addition that repaid in dollars and cents.

At the outset, it was not deemed of any advantage to have a dust collecting system that would catch all the dust. In plants where these high results are obtained, the disposal of the finer dust accumulated is sometimes a problem because it cannot always be added back to the circuit, sometimes because of concentrated alkalies in this dust, and often as a result of building up a heavy circulating load in the dust collecting system. In the case of the Kosmos Portland Cement Co. a reasonable dust collecting efficiency was all that

Six banks of dust collectors have two 125,000 c.f.m. fans on discharge side in addition to original installation of induced draft fans on kilns



Smaller type weighing conveyor for silica or iron oxide

Larger type continuous weighing conveyor for limestone

was required and wanted. It has been estimated that upwards of 87 percent of the kiln dust is recovered and the management is very well pleased with the installation after the six-year try-out.

To get the numerous ducts, collectors, etc., tied into the mills required a considerable amount of alteration and engineering and a nice job has been made of the installation. The dust from the cyclone-type collectors falls to a series of screw conveyors that deliver the dust back into the mill system. These conveyors are driven by motors through gear reduction units. No repairs have been needed on the installation except replacement of small sections of the duct lining at the hot end.

Continuous Proportioning System

A second interesting installation at this plant was made about three years ago whereby in the raw end, a continuous proportioning system was installed, based on the use of Jeffrey-Traylor Waytrols.

The plant uses a four-component mix, consisting of limestone, silica sand, iron oxide, and clay. These materials are stored in steel bins arranged in a straight line in such a fashion that all four products can be delivered to a 24-in. steel pan conveyor underneath.

At the far end of this conveyor is fed the crushed and previously dried limestone. The stone here flows out of a double cone-bottomed bin over an electrically-vibrated pan that is a part of the Jeffrey-Traylor Waytrols. The material moves along this

(Continued on page 53)

Electrical controls for the continuous raw material proportioning system

BLENDING FINES

Changing Sand Size Distribution

Part I: Examples of practice in American Plants

ONE OF THE MOST DIFFICULT problems, challenging the ingenuity of plant operators and designing engineers, is the economical production of commercial sands to meet size distribution specifications. The day when sand will be acepted for mortar or concrete without meeting fairly rigid screening tests is rapidly passing. Specifications requiring 5 to 10 percent passing the 100-mesh sieve and 15 to 30 percent passing 50-mesh are common. The "fines" that purchasers want are firm sand grains and not "silt," clay or loam. Silt, however, may be anything—clay or feldspar, etc.—it can be silica, too, and fine silica grains are ordinarily what is desired. Probably clean, sound, hard grains of any mineral are acceptable for the minus 50-mesh and 100-mesh material.

First Step—Examine Your Raw Material!

No two deposits of sand are ever just alike. Why this is so is readily apparent to one at all familiar with the geology of sand deposits. Sand was, and still is, deposited by water and wind. Constantly changing currents as well as changing contours of the landscape prevent anything like continuity or uniformity in deposits. Again, many deposits have been altered after the original deposit was made. So, you can't always tell what you will encounter in different parts of a single pit.

Operators we have met who fully understand some of these things make it their first job to open up just as long a face in the pit as is possible, and as soon as they can. This is far better than dependence on test holes, because one can actually see what he's got and how it lies. It follows, of course, that he should very carefully sample all parts of the pit face and make sieve analyses. He'll know then whether or not the necessary fines are in the raw materials. These fines may be segregated in one or more parts of the pit, and he can design his mining operation accordingly.

Where the deposit is under water, the operator can't see what he has; and he can be sure that if he is excavating by any other method than a dredge pump, he will lose some or all of the fines that occur naturally in his material. However, these may be collecting in some part of the pit, and possibly can be recovered separately and added to the raw material as needed.

Examine Material in Waste Launder

The first step, if your washed and sized sand is deficient in the 100-mesh and 50-mesh sizes, is to catch samples of the waste from the washing plant and analyze it for these missing sizes. It will generally be found that some fines are being lost in this manner, and if they are, the operator can be assured there are ways to recover them.

If the fines are not to be found in the material going out with the dirty wash water, obviously the operator must look for them elsewhere. He can look for them in his own acreage, or buy the fines from another producer, or he can crush or grind some of his coarser material to provide for whatever specifications his sand must meet.

Recovery of Fines

To recover minus 50-mesh and minus 100-mesh material in a wet operation requires some special kind of screening or settling device. It is generally conceded that it is not feasible to screen finer than 20-mesh. Such screening, of course, will take out the oversize but it will not separate 30-mesh from 50-mesh material. Vibrating screens have been used to make a 60-mesh separation of clay; and the possibility of making a screen separation between 30-mesh and 50-mesh should certainly be explored. Possibly one reason sand producers have not met with success in screening below 20-mesh is that the screens are generally overloaded with coarser material, and possibly because too small a volume of water is used.

The simplest way we know of to recover fines going to waste in wash-water launders is to trap them from the bottom of the launder. One way is to place fine-mesh screen sections in the bottom of the launder, which can be blanked off with metal plates when not in use. In a running stream of water, such as the launder is, the sand and mud in suspension, flow somewhat segregated, with the coarsest material dragging the bottom, flowing at a somewhat slower velocity than the finer material on top. The additional friction provided by the screen surface will still further slow the velocity of the under current carrying the coarse material, and some of it will be trapped and drop through the screen, together with some of the dirty water.

A refinement to this method of recovery is to provide means of raising and lowering the discharge end of that section of the launder containing the screened bottom. The less the slope of the launder, the slower will be the velocity of flow in it, and the more the material in suspension will drag on the bottom and be trapped. It is necessary, of course, for consistent results, that the volume of water and material in suspension remain as constant as possible.

There are various other methods of

trapping recoverable fines in the wash water. Simply enlarging the launder at any convenient place by increasing its width or depth, and providing a valve or outlet in the bottom, will serve to catch the coarsest material and hold it by reducing the velocity of the stream at that point. A sand cone, or a settling tank, may be inserted at any convenient place in the launder to accomplish the same purpose.

Another method is to let the wash water flow into a large tank or settling basin, with on overflow. If this overflow is made adjustable, the degree of fineness of the material recovered can be regulated. The difficulty comes from emptying such a tank or settling basin, unless it is elevated and the settled material drawn off through gates or valves. One possible way is to have two or more such basins, so that the flow may be diverted from one to the other, and the basin not in use can be emptied by a clamshell or some other method.

Another difficulty with a simple large settling basin is that while filling, the water is stilled to such an extent that a lot of undesirable mud may settle along with the desired fines. That can be prevented by use of some agitating or stirring device which will keep the mud in suspension but allow the coarser fines to settle. One such device is what is known as the bowl classifier, much used in the mining industry and the portland cement industry. In the first case it is used to get rid of the "slimes" and recover the fine ground ore, and in the other case to recover the fine ground "finished" raw material and return the coarser for further processing or grinding.

The bowl classifier offers great opportunities for recovering desirable fines in the commercial sand industry, although it is seldom used. The operation is continuous and automatic. Rakes on the bottom of the agitating or stirring device bring the settled sand to a center discharge where it may be transferred with a sand or slurry pump to any part of the operation. We believe the use of this device would in many instances solve the producer's problem of recovering the fines now being wasted, and in clean condition fit for use with his sand aggregate.

It is quite possible that the ingenious producer can devise other ways of keeping the contents of his settling tank agitated so as to prevent settling of the clay and unwanted "silt." Cement slurry tanks are often kept agitated by bubbling compressed air up through them from the bottom. So far as we know this has never been tried in a sand-settling tank, but it might work. Then there are ways of putting baffles in tanks, on the same principles as baffles in dust collectors, so that the deposit made in the quietest sections does not contaminate that in the other sections. There is a wide field here for experimenting.

One advantage of any type of agitator settling tank, or bowl classifier, is that there is an additional washing so that the fine particles are cleaned as well as separated. This can be made more certain by introducing, in some manner near the bottom, additional clean wash water. If this is done with water in sufficient volume, it might serve as the agitating medium as well. This then becomes a rising current classifier, of which more will be said in later issues. This rising current of clean water can be employed with any of the cone or tank type of collectors or traps already referred to, but of course a lot of caution against too much new water is necessary if the producer is attempting to collect 50- and 100-mesh sand.

Follow Nature

In all the methods of recovering fines described above the producer is merely following nature. Rapidly flowing streams deposited mostly gravel until they came to a bend or a pool where the current was stilled, and then they dropped sand. The finer material was carried on until water became nearly motionless. That is the reason why in the deposits formed by rivers one seldom finds enough fine material unless the area excavated is large enough to cover all the conditions described.

Introduction

● ***THIS IS THE FIRST** of a series of articles, prepared from the joint experiences and observations of the editorial staff, on preparation of commercial sand to meet various specifications. It is not signed because it represents the work of no one author. It is the result of many notes, descriptions of many plants, and discussions at the sessions on plant operations at the conventions of the National Sand and Gravel Association, etc.*

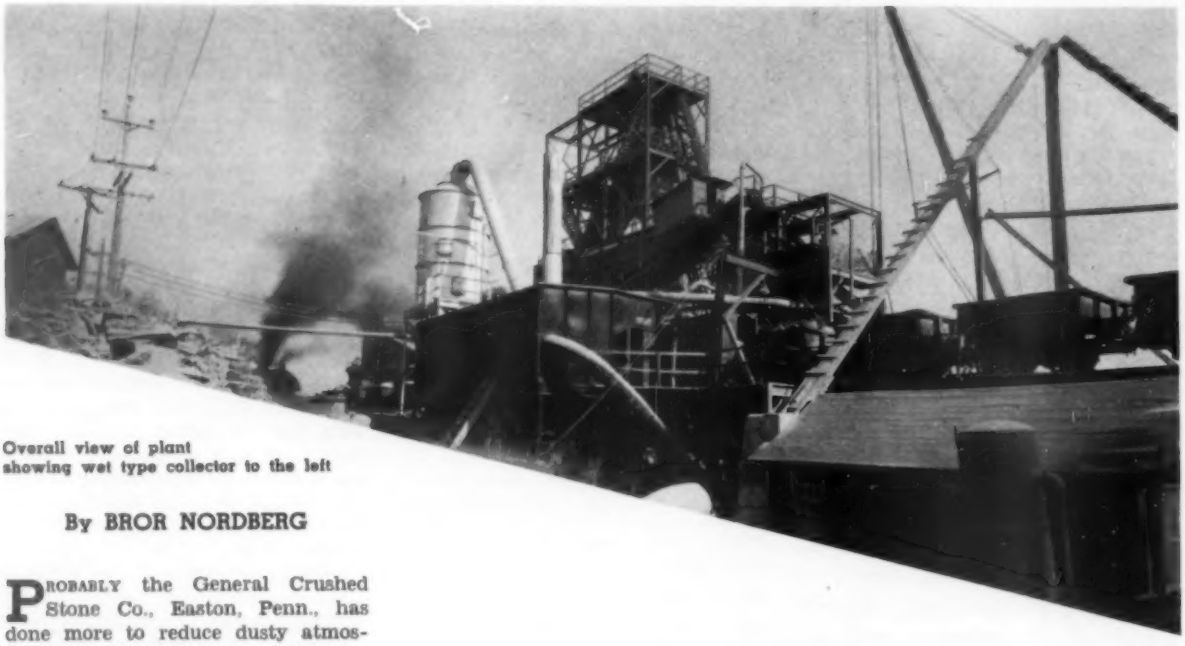
This series is supplementary to the one written by the late Edmund Shaw and published serially in Rock Products, 1939-1941. Shaw's articles went very thoroughly into theory, and those who want to delve into the theory are referred to those articles.

Here we shall leave mathematical and physical theory pretty much alone and discuss commercial devices being used to accomplish results by various operators. Judging from discussions with producers, one can learn more by experimenting with his own materials than by studying the theory of falling bodies in water. The trouble in practice is that all theories are based on water, which has a specific gravity of one (unity), and water in a sand plant, carrying a load of suspended silt and clay, does not always respond to theories based on clear water.

We want to make this a FREE FOR ALL DISCUSSION. Producers who have solved some of the problems in their own way are invited to send in their contributions; and we'll pay for them. Producers who have problems to solve are invited to send them in, and if we can't help solve them ourselves, we'll find a man who can help.

In our discussion, as the reader will find, while we haven't gone into theory, we have done some speculating as to POSSIBLE ways of operating. We may be all wet, and if we are don't hesitate to tell us so; or if we give you an idea and you want to take it up and speculate, or discuss it on your own, come on; we'll provide space for you to do it. — THE EDITORS.

Wet System Keeps Stone Plant Clean



Overall view of plant showing wet type collector to the left

General Crushed Stone Co., Oaks Corners, N. Y., plant draws off all dust from crushers, screens, chutes, elevators, and conveyors

By BROR NORDBERG

PROBABLY the General Crushed Stone Co., Easton, Penn., has done more to reduce dusty atmosphere and to improve working conditions in its plants than most large producers of crushed stone. The company operates quarries in New York, Pennsylvania and Massachusetts, and has taken steps for dust abatement in all of them. New York State, in particular, has given incentive to the installation of dust arresting equipment, through dust control legislation, but the General Crushed Stone Co. program was not prompted through compulsion.

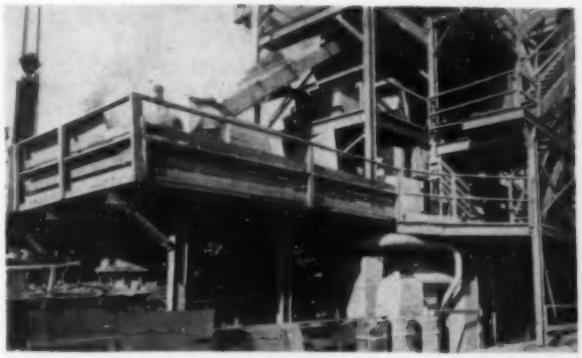
Cyclones and bag-type collectors are used in a number of the plants, but recently wet collectors have been placed in service. The wet collector is used due to the convenience in the disposal of stone dust as a sludge, where it is not desired to save it for agricultural stone or for other use.

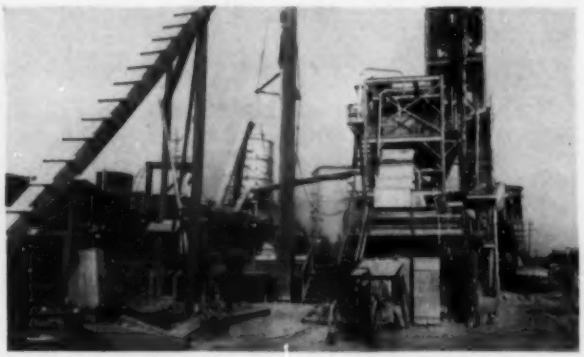
Showing types of enclosures around chutes and pipes for drawing off dust to collector

Wet Dust Collecting System

At the Oaks Corners plant near Geneva, N. Y., a wet collector is in operation that will serve to illustrate how these machines operate. This plant has a rated capacity of 200 tons of crushed limestone per hour and there is no market for dust as agricultural stone. It is desired to get rid of the dust without handling it as such.

Practically all the dust at this plant is developed around the crushers and scalping screens. There is a No. 30 Superior-McCully primary gyratory crusher fed by side-dump quarry cars and three reduction crushers—two 13-in. McCullys and a No. 49 Kennedy gyratory which makes the fine reduction. The screens operated in connection with the crushers are a 5- x 12-ft. Tyler-





Left: Enclosed chutes, top left, and piping and housing at reduction crusher. Right: Wet collector to the left and hoods and piping at screens and chutes

Niagara double-deck scalper and a 2-deck 5- x 8-ft. double-deck screen to get the fines out. All the stone is elevated to sizing screens where it is washed and graded, but dust collection is confined to the lower part of the plant.

By catching the dust at these points of origin, very little is left to escape until the dust is washed and dropped into bins. None of the plant is enclosed, so the efficiency of a dust collection system depends upon the adequateness of the enclosures around the sources of dust generation.

The discharges of all the crushers are enclosed with sheet iron, hoods have been built over the screens, all discharge chutes are enclosed and the lower end of the main bucket elevator to the finish screens is closed up.

Gathering pipes carry the dust through two 18-in. main pipes to the dust collector, one of which gathers the dust from all the crushers and the other from the screens, chutes and bucket elevator.

All the dust is pulled through a Northern Blower Co. No. 10 hydraulic classifier by a No. E-60 American Blower Co. fan, where the dust is caught and the cleaned air exhausts through a stack. The fan is driven at 1110 r.p.m. by a 40-hp. electric motor.

The collector is a 10-ft. diameter cylindrical steel chamber about 15-ft. high that contains two filtering beds of coke to clean the dust-laden air. One six- to eight-inch layer of coke rests on a deck of ½-mesh wire cloth about one-third the way up from the bottom of the collector and the other bed is equally spaced. The coke is a No. 3, screened at 2- to 2½-in. size, through which the dusty air is drawn and water sprays over the coke beds wash out the accumulation of dust which is passed off through a pipe into a quarry sump as a sludge. Water is applied at 20 to 30 p.s.i. from the main plant water line. The air is drawn by the fan up through the two filtering beds in order and flows from the top of the collector through a pipeline to the fan to exhaust.

Much of the efficiency of this type of collector depends upon keeping the filtering bed clear. About one and one-half tons of coke is the requirement for the collector. Every few weeks the coke is washed down by water under pressure and agitated, and the charge is renewed at the start of the next operating season. The load on the fan motor is a fairly close indicator of the condition of the filter beds.

On even the dryest days, a light mist coming out of the exhaust stack from the collector is the only visible sign that it is in operation.

Control Raw Material

(Continued from page 49)

steel vibrating pan to a weighing conveyor of all steel construction, including the pans, which are 24 inches wide. This weighing conveyor is essentially a pair of scales which are mounted on a suitable fulcrum and it moves up and down according to the load. A variation in the load on this traveling pan causes a slight vertical movement in it, which is tied into the electrical system serving the vibrating pan in such a manner as to increase, or decrase, the intensity of the vibrations, thereby increasing the flow of material. The scale mechanism, including the visual adjusting mechanism was supplied by the Toledo Scale Co. This feeder is the largest of four, and is a No. 360.

The weighing conveyor of steel construction was adopted over the use of a belt because of the heated limestone from the driers. It has proven a great success and, similar to the other feeders, has not required any upkeep for three years.

The electrical switchboard includes a series of flashing colored lights, giving the operator a visual means of noting the operating condition. Tonnages are calculated from an hour meter mounted on the switchboard.

The silica and iron oxide are fed by individual Waytrols that are toys compared to the limestone feeder. They are called No. 100's and have a short 6-in. belt conveyor as the weighing conveyor. However, they may look like toys but they have proven to be rugged, easily supervised, visual, and accurate in their functioning, and, from a construction viewpoint, are neat and compact.

The clay feeder is a No. 301 Jeffrey-Traylor Waytrol and, like the stone feeder, uses a steel pan conveyor, but of slightly smaller dimensions.

Thus the four components are blended into a continuous and accurate mix with each component being individually weighed.

Sell Lime Plant

AUBURN CHEMICAL LIME CO., Auburn, Calif., has been sold to J. J. Taylor and associates, Russ building, San Francisco, Calif. It is reported that the new owners will operate the property in conjunction with chrome holdings which they own in the adjoining district. Present mill facilities of the lime company will be expanded to handle chrome ore, and manufacture of lime will be discontinued.

Buy Mixer

CONCRETE BLOCK & STONE CO., Hagerstown, Md., recently installed a new 12-cu. ft. Stearns mixer and skip hoist, according to H. E. Bester, manager.

Plenty of Business!

Industrial Sand Producers, However, Have War-Time Problems

At Chicago, Ill., June 3 and 4, the eighth annual meeting of the National Industrial Sand Association, was attended by more producers than probably any previous meeting. The program had to do almost exclusively with problems of the industry incident to operating under war conditions.

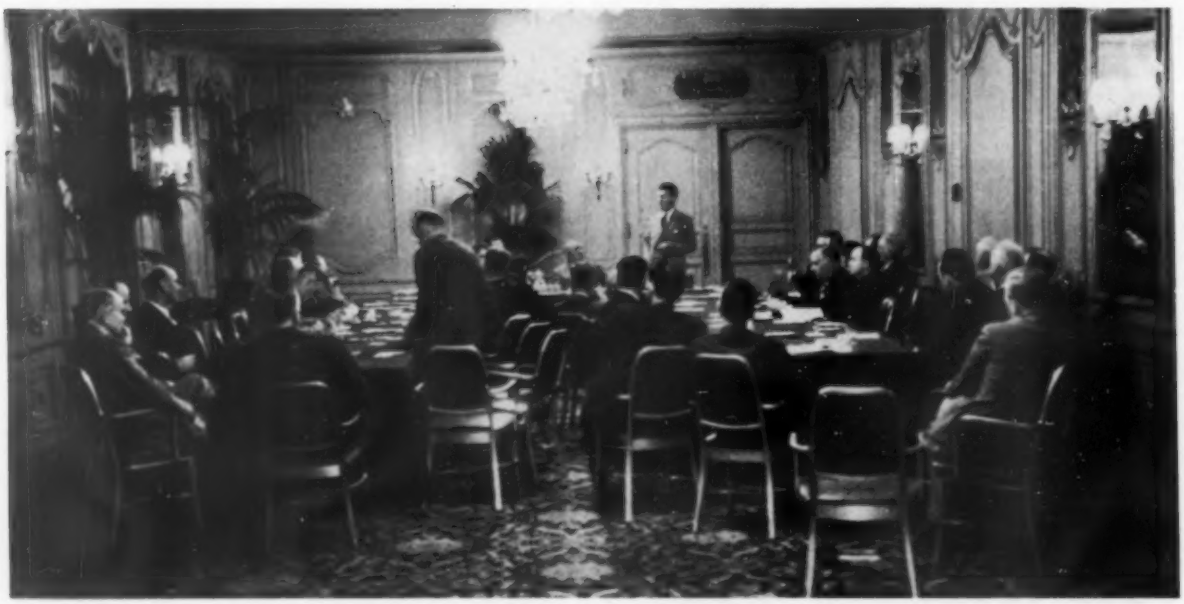
Officers-Directors Reëlected

All officers and directors were reëlected for another year. They are: J. M. Strouss, Morgantown, W. Va., president; T. C. Matthews, Lewistown, Penn., vice-president; A. V. Gregory, New York City, treasurer; directors are, Hamilton Allport, Chicago, Ill.; E. J. Beyer, Rockwood, Mich.; E. M. Durstine, Columbus, Ohio; C. M. Hardy, Evansville, Ind.; Mark T. McKee, Detroit, Mich.; George A. Thornton, Ottawa, Ill.; and the following past-presidents, A. Warsaw, Chicago, Ill.; R. G. Hay, Zanesville, Ohio; L. M. Hansen, Chicago, Ill.; and one honorary member, P. S. McDougall, Ottawa, Ill.

At an open meeting of the board of directors on June 3, in addition to the usual routine business Executive Secretary, V. P. Ahearn, discussed the situation of the industry in respect to labor, wages, car supply, and price rulings. On the subject of wages he said that the industry probably would soon have a 40c per hour minimum, which would affect very few producers since nearly all wages in the industry were already this or more. Mr. Ahearn, and the board supported him, thought that every effort should be made by producers to coöperate with O. D. T. in giving advance information on car requirements and prospective shipping destinations. In the matter of pricing industrial sand under M. P. R. No. 188 of O. P. A., he called attention to the rulings in the case of one or more Tennessee silica producers (given on pp. 118, 120 of Rock Products, June issue).

With President Strouss presiding the first general session opened with a discussion of the P-56 Order of W. P. B., under which the industrial sand industry obtains its priorities. Carl Kelley, regional advisor with headquarters in Chicago, was introduced. In order to decentralize as much as possible the mining equipment division of W. P. B. is establishing regional offices, which will serve largely in advisory capacity.

Edward W. Bauman, chief, nonmetallic section, mining equipment division, W. P. B., then took the floor and described a typical day's activity in his Washington, D. C., office. Most of his time is spent helping mine operators get priorities, both those issued by W. P. B. and those which have to come from O. D. T. and other government administrative bodies. In response to a question about new motor trucks, he said these were becoming very scarce and hard to get, but that as long as there are any the mining division would get its pro rata share. Mr. Kelley said tractor parts were getting easier to obtain. When applying for transportation equipment and parts it is



Edward W. Bauman, chief, non-metallic section, mining equipment division, W.P.B., addressing industrial sand producers at recent Chicago meeting at the Palmer House

necessary to use the right application form. While the mining equipment division can assist in expediting such applications, other divisions or O. D. T. forms must be used.

Contract Repairs

One of the most bothersome problems of producers has been how to take care of quota applications when repair work is done by an outside shop or contractor, as for example rewinding an electric motor. Mr. Bauman said that the producer must procure the necessary copper wire and other critical materials, directly or indirectly, and that it was permissible to deduct the labor cost and show only the material cost in the quota record. It was also brought out that in procuring repair parts for construction equipment (shovels, cranes, etc.) under L-192 of W. P. B., it is necessary to use the endorsement form required under that order in addition to those required under P-56.

Prospective Car Supply

C. R. MEGEE, manager, open-top car section, car service division, Association of American Railroads, said that there had been no serious shortage of cars to date, but that the situation was constantly getting more serious. Cars are not being replaced as fast as they wear out, or are wrecked; and track and rolling stock are not maintained as they should be. On the other hand great progress has been made in getting more use out of present facilities, but naturally there is a limit here, and it has just about been reached.

The local representative of the car service division A. A. R. R., a Mr. Farmer, spoke of the extra load thrown on the use of open-top car equipment by the larger requirements for coal and iron ore. Because of the lateness of opening navigation on the Great Lakes, more ore and coal than last year may have to be moved in 30 days less time. He said industrial sand producers would receive every consideration that realization of the importance of their product demands.

Packaging

A. Y. GREGORY, Whitehead Brothers Co., New York City, reported on W. P. B. orders covering shipping containers as they affect industrial sand shippers. Bag limitation orders cut the use of all types except paper to 50 percent of 1941 requirements; burlap bags can not be used at all. There are no restrictions on the use of paper bags, so far as silica sand is concerned.

Round-Table Discussions

T. C. MATTHEWS presided at the Friday morning round-table discussions. V. P. Ahearn, executive secretary, in opening the session outlined the features of the Grand Rapids

Married since last meeting: Mrs. C. F. Bryant Hartmann (George W. Bryant Core Sand Co.) talks to C. R. Wolf (New Jersey Silica Co.)

Gravel Co., ready mix concrete drivers' case as it applied to the industrial sand industry. He urged the industry to study its relations to casual employment of truck drivers for contract hauling to determine whether there was any Social Security tax liability. He suggested that every manufacturer see that those whom he may employ to do work are covered by Social Security tax payments from some source even though the drivers may be considered contract haulers.

SECRETARY AHEARN also brought up the question of the 3 percent tax on transportation for hire. It was pointed out that in the case of stripping where the driver of the hired vehicle is given definite instructions for disposal of material, this work is considered transportation for hire and is subject to the tax. This question has been covered at length in the association bulletins to which Mr. Ahearn referred.

The discussion also turned to accelerated depreciation allowance and the matter of renegotiation of contracts. Due to the involved problems concerned with accelerated depreciation, discussion on this question was dispensed with. The opinion was expressed that the industrial sand industry had been exempted from the necessity of renegotiation of contracts.

On the question of manpower, it was brought out that some difficulty had been experienced by industrial sand companies because the industry had not been specifically included in the essential occupation classifications of the War Manpower Commission. When supporting evidence was introduced as to the customers served, no difficulty was experienced in securing deferments. If possible, the industry should receive recognition from the War Manpower Commission and designation as an essential occupation. However, the industrial sand industry cannot expect to have its employes exempted from war service but only to receive deferments. Secretary Ahearn urged everyone to file 42-B forms on all essential employes.

The 48-hour week order does not present a problem to the industry as most companies are operating 48 or more hours per week, except office employes. If proper representations are made, exemptions can be obtained for certain classes of employes.

Referring to Executive Order 9240, covering double time, Secretary Ahearn said that companies are required to pay double time for the seventh day based on seven consecutive days in the same work week. Certain holidays are mentioned as calling for payment of time and a half such as, Christmas, New Years Day, Fourth of July and Memorial Day. While there is no direct penalty for non-observance, the Internal Revenue Bureau may require that the company state that the income tax report complies with this order.

Turning to the wage and salary controls by the War Labor Board and Internal Revenue Bureau, Secretary Ahearn referred to Byrnes' recent ruling regarding intra-plant adjustment of wage levels as being justified. This ruling also permits companies to increase wages up to the minimum wage bracket of similar classes of work prevailing in that area to improve competitive position with other companies. Authority to make individual wage adjustments is now curtailed, and a company must present a definite plan or a collective bargaining agreement as a basis for a wage increase. The company must receive specific authority from WLB in the absence of these conditions. A retirement pension plan is permissible as employe inducement; also vacations may be used to improve employe relations.

A. Y. GREGORY presided over the final session, at which the main sub-

(Continued on page 80)

LIME FORUM

Lime Plant Behind the Battle Front

Concluding article describes the procedure followed in cutting down fuel consumption and raising production

By VICTOR J. AZBE

"WE WERE SADDLED with these kilns and this hydrator; we mastered the hydrator alright, but the kilns fail to function right," said Leonard D. Holman, lime plant superintendent, Hawaiian Gas Products Co., commenting on his problems. "The kiln gives us over-burned lime and core in the same draw and with our 'puka' coral limestone, core does not break out clean. It gives us low CO_2 gas concentration and uses excessive quantities of oil for the small output and about all this there is nothing we can do, it all comes down the kiln and out, hopelessly mixed up. More or less oil, shorter or longer draw periods, higher or lower draft, nothing helps. If we reduce the core a bit we increase the overburned too much and if we reduce the overburned then we draw half stone. Then the kiln will not hang to permit trimming and if it does, as it is not arranged for, we have an awful job trying to bring the charge down."

I sympathized with him, then decided for myself that it would be best with such able and eager men on hand for me to do nothing except occasionally offer some incidental or interpretative remark or suggestion. So I pitched the problem right back at them and they went at it in a manner that did my heart good and I positively loved them for it.

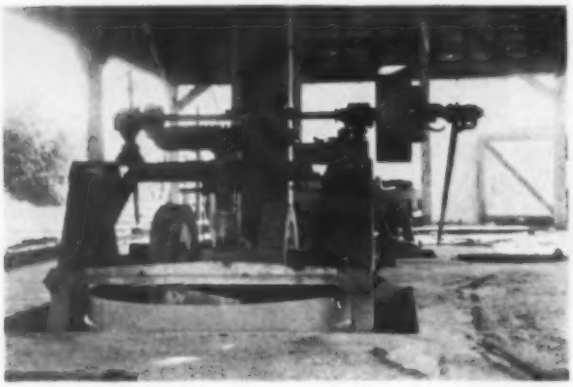
First Mr. Mau started out on what we could call an exploratory survey. Just like a coroner's surgeon does with his scalpel, only that this specimen was not dead—not quite. He also used instruments but of a different nature, including a gas testing three-chamber Orsat. However he did not just take a gas sample or even a series of gas samples, that is not exploring; he immersed many sampling pipes to different sections of the kiln and analyzed gases from all within as short a range of time as possible. One gas sample may have told him what the kiln as a whole was doing, but would not have given him sufficient data to plan corrective measures, while many gas samples from different sections revealed conditions enabling one to plan improvements.

One of two kilns used in high-pressure steam curing of cinder-lime brick

From over the furnaces oxygen was low and CO high, from kiln middle and shaft end, CO_2 was low and oxygen was high. There was no uniformity and at no time in later testing was uniformity found. The stream passing up directly from over the furnaces was smokey and charged with carbon monoxide. The streams passing up anywhere else in the kiln had too much air and not enough combustible, all because the gases and vapors from the burning oil coming from the furnaces failed to distribute themselves over the shaft cross-section.

Correcting High Oil Consumption

Oil consumption was high, but for that matter all oil fired kilns have a high oil consumption, no one yet has mastered the subject of oil burning. Mr. Dittlinger burned oil for years and he appeared satisfied with an average of 55 gal. per ton. Mr. Tremoureux of United States Lime Products Corporation, with his small kilns produces a ton for about 45 gal. but that also is lower in efficiency than we get with natural gas, the equivalent of 32 gal. per ton of lime produced. A great deal of development is justified to bring oil firing in line and nowhere is that more important than in Hawaii. First, for the sake of high strength CO_2 gas, with-



Left: Wet pan mixer used in the preparation of aggregates for cinder-lime brick department. Right: Brick press for production of cinder-lime brick

Rotary lime kiln plant of the Hawaiian Gas Products Co. Provision also is made at this plant to collect CO_2

out soot and odor, second because oil, although cheap on account of artificially established price ceilings, would be rather expensive and I am almost tempted to say that it should be expensive since tankers to carry the oil are scarce.

Chief Engineer Morgan then suggested: "If we have a variable gas analysis over the kiln we must also have variable temperature and I would like to test for that." He therefore built a thermocouple that could be hammered, then drove it into the lime within the shaft, half way up the kiln over the fire boxes. Right at the wall, temperature was 600 deg. F., 18 in. in it was 1400 deg. F., and in the middle of the shaft it was down again to 900 deg. F., checking out rather well with conclusions one would have formed from gas analyses. No uniformity whatsoever in combustible distribution, in gas flow, in temperature and of course no uniformity in lime made either.

At this point Superintendent Holman started to tear out all of the furnaces and much of the walls on the idle kiln. He said: "We will not get very far with what we have, let's change the kiln as close to proven natural gas type as firing with oil will permit us to do."

Chief Engineer Morgan added: "That is right, and these burners we have are not what we want either and, as no burner now on the market will quite do for the sort of long, lazy, hot CO_2 tempered flame we want, I will build new burners myself. The burner should be a gasifier, it should vaporize the oil in part and crack the remainder into simpler combustible gases. This should be done with very hot recirculating gases containing but little air and there should be very little complete combustion in the burner or burner lead to the kiln. Combustion should take place as much as possible within the kiln, where oil vapors and gases are intercepted by the air coming up the cooler. Of course we may have the devil's own time with the residual carbon, as our oil is of the bunker C type but we will overcome that somehow."

Plans called for hot gas recirculation, withdrawal of gases from the kiln at 1300 deg. F., from just over the dissociation zone and reinjection of this gas through the burner into the kiln, mixing so to speak the too cool end of the hot zone, with that which tends to be too hot; or expressing it still differently, burning the rather touchy coral rock in a high volume of lower temperature gases, rather than in a low volume of too hot gases in accordance with the principles governing the "Azbe Recirculating System."

But this system of calcination we contemplated required a special, very heavy chromium alloyed hot gas offtake pipe, and where can one get something like that these days, and all the plans were depending upon this pipe. Then the Pearl Harbor Navy Yard offered to cast it for us in their own foundry; they were glad to do that to get the needed CO_2.

But in the meantime Chemist Mau continued to study the kiln by means of gas analyses and Superintendent Holman never was far away. They would say: "We can't get right with this kiln as it is, but if we find out exactly what it is doing we should be able to at least improve it." Theory and practice never worked nicer together. Chemist Mau would show high CO and Superintendent Holman would adjust to no CO and where Chemist Mau showed high oxygen, Superintendent Holman would in some way lower it. The CO_2 pen on the recording analyzer chart crept up from day to day, from 18 percent to 20 percent, then 22 percent and

by the time 25 percent was reached a void started to develop in the rooms where Navy cylinders were being filled, as supply was approaching the demand, which certainly gave everybody that grand feeling that only comes from a job well done.

It was interesting being up on top of those kilns as one commanded quite a view and something was going on all the time. The sky hardly ever was empty of planes which in their perpetual practice would often swoop at the highest of speeds low down over the buildings. Then the sea traffic—one day I noticed one immense "flat top" coming into Pearl Harbor surrounded by protecting destroyers. What stories it could have told!

Improve Hydrator System

The 4- x 16-ft. hydrator system was changed radically from the original installation. Method of operation also was changed. The number of bearings in the hydrator was increased and the roller type substituted with supports changed to a stronger design. The original spray dust stack was completely abandoned, and a Schneible dust collector was installed and arranged by the lime company in such a manner that the normal amount of hydrator water was recirculated many times. Water obtained from the collector was pumped to the hydrator by a readily adjustable and very ingenious pump, both designed and built by Mr. Morgan.

This is one plant where the hydrator man also does the sacking, the only "one-man" hydrator. What makes this possible is the maximum-minimum temperature alarm developed by Mr. Holman. He laughed at the wooden paddle test method. He said: "Why, that shows what happened 15 minutes before and in that interval it is too late."

The hydrator temperature alarm rings a bell if temperature falls to 210 deg. F., or is raised to 230 deg. F., while as a general rule it is endeavored to carry 215 deg. F., registered by a recording thermometer. When the bell rings the man sacking checks up on things but otherwise the hydrator operates itself beautifully and as dustlessly as I would not have imagined possible. The vapor discharge on the roof has no lime dust in it at all—at any time—and no hydrate could be found anywhere on the roof. There was a bit of hydrate on the floor at the sacker, just a few shovels full, and even that was too much to suit President Renton. Mr. Mau, the chemist, said to me: "The hydrator is awfully dirty is it not?"—evidently he was plugging for greater cleanliness, but I could not back him up this time and had to say: "Why no, it's cleaner than any I have ever seen, and it is the only one man hydrator I have ever seen, and the credit all goes to you people personally and no one else."

There are many very dirty hydrating plants, because one can not consistently get a truly clean hydrator stack by simply spraying with water used by the hydrator. As many hydrators are operated with but crude controls, and this Hawaiian installation presented such a beautiful solution to both the problem of cleanliness and recovery as well as the problem of control, I expressed the desire to borrow the idea to use on the Mainland, which hereafter will be called the "GasprO System." What sort of hydrator the system was founded on or what type of hydrator it may be installed on does not matter since the system constitutes a separate entity developed jointly by Messrs. Renton, Morgan, Mau, Holman.

Percentage of rejects was high but that never is the sole fault of the hydrator, the main responsibility almost always resting with the kiln. After the kiln is improved and the hydrator is fed a uniform product, the rejects will greatly diminish.

But Chemist Mau wanted to know what the rejects were, and he started on a special investigation. They evidently were a composite of four groups and he wanted to determine their respective amounts. He found that the rejects contained about 35 percent of good but coarse hydrate which started him out on the study.

Hydrate rejects could in general be divided up in the following four groups:

Group 1: Coarsely crystalline hydrate, so heavy as to be rejected by the separator, resulting mainly from under-burned portions of lime, hydrated at too high internal temperatures due to too great avidity of water of hydration and insufficient access of water of cooling. Fault is in the kiln and hydrator combined. This finding was determined from loss of weight on heating to 1000 deg. F.

Group 2: Unburned limestone caused by high core in lime due to difficulty of separating the core from the friable lime. Fault of the kiln and nature of rock. This was determined by loss of weight between 1000 deg. F. and 1800 deg. F.

Group 3: Burned lime, available, but slowly, and hydratable, but not in the time it has available in the hydrator. This is caused by overburning and shrinkage, reducing possibility for penetration of water and surface of hydration. Fault of kiln and hydrator.

Group 4: Burned lime but combined with impurities or occluded by either slags or by recarbonated portions impenetrable to water. Fault of kiln and impurities in stone.

With all this going on one can see that my work was very interesting but besides the work there were many other interesting things too. Only a few blocks from the plant there was the humming native quarter, where one would find himself packed among Japanese, Chinese, Hawaiians, Koreans, Portuguese and Americans in civies as well as all sorts of uniforms. In this crowd the Japanese predominated and they even seemingly predominated in the long rows waiting at the booths to buy War Bonds on December Seventh '42, when the Honolulu quota was oversubscribed four or five times, as it always is. The three hundred thousand Japanese on the Island, most of them American born, are free and are at peace and there is no trouble from them. They never were organized to make trouble, even on December Seventh '41, or probably they are honestly peaceful, because they are removed from the Japanese system and like the American system under which they work, better. As it is they live luxuriously, as compared to life in the far East, while otherwise they would, by comparison, be starving. It all speaks well for our melting pot into which others want to break by brute force.

Anyway, when returning from Waianae Plant past Pearl Harbor to Honolulu I was surprised to be told by Mr. Mau that all the men I worked with that day were Japanese as every man in that plant except Superintendent George Smith, was of that extraction. This is in direct contrast to the Honolulu plants of GasprO where no Japanese are employed. And I liked them too, particularly the youngish looking American-born kiln fireman who was stripped to the waist, sweating away in front of the hot kiln with never a thought for loafing, and the assistant to the superintendent who, within his range, was well posted indeed. I have little doubt that most of them hate Tojo as much as we do.

(Continued from page 81)

Manufacturing Low Alkali Portland Cement Clinker

By H. McLARMOUR, E. L. McMASTER, and WM. JACQUES*

THREE METHODS of decreasing the alkali content in portland cement clinker are practiced.

1—Using raw materials low in alkalies.

2—Addition of extraneous reagents to the kiln feed, that in turn expedite the expulsion of the alkalies at clinkering temperatures.

3—Volatilization of the alkalies by additional heating.

Case 1—A positive method and desirable when suitable raw materials are economically available.

Case 2—Well covered in the February issue of ROCK PRODUCTS by Mr. Hubert Woods. His article, "Removing Alkalies by Heating with Admixtures," shows how calcium chloride added to the raw mix increased the alkali expulsion in a series of experimental trial burns.

Case 3—It is well known that a considerable decrease in the alkali content from raw mix to clinker is effected during normal burning process in the rotary kiln. It is reasonable to expect this decrease to vary with different raw materials as well as the process and equipment. Mr. Woods, in his article, reports for wet process plants, variations of from 8 percent to 32 percent volatilization for the Na_2O and from 21 percent to 82 percent for the K_2O. We have found our volatilization of the alkalies in the kiln to be 21.1 percent for the Na_2O and 45.1 percent for the K_2O.

This great decrease in alkalies effected in the kiln at clinkering temperatures shows a possibility to further decrease the alkalies in hot kiln discharged clinker by prolonged heating at desirable temperatures.

Heat Treating Clinker

A brief description of a practiced means of prolonged heating follows:

The hot kiln clinker discharges directly into a converted rotary cooler. This rotary cooler is brick lined throughout with a dust chamber and stack at its discharge end. A burner is installed at its feed end. In operation the kiln discharged clinker is reheated in the treater to substantially clinkering temperature. Flame, effluent gases and reheated clinker travel in the same direction. This condition is the reverse of that in the rotary kiln where the material flow is counter to the flame and effluent gases.

Having the re-heated clinker flow in the same direction as the effluent gases permits greater flexibility for controlling the residence of the clinker at a desirable temperature in a reducing atmosphere.

We have found reheating in a reducing atmosphere to be most satisfactory in prolonging treater lining life and expelling alkalies. This is brought about by the characteristics of a reducing flame which is non-impinging.

For the statistical minded, the following data may be of interest:

Kiln: 10- x 240-ft., natural draft, wet process, equipped with chains, gas fired, maximum production—1550 bbl. per day;

Treater: (converted rotary cooler); 7- x 95-ft., bricked throughout, natural draft, fuel (oil or natural gas) for a total of 400,000 b.t.u. per barrel.

Our raw materials consist of "high" and "low" limestone; both diluted with the same interlaid shale, the amount of which determines whether the limestone is of "high" or "low" purity. The alkalies are associated with the shale, since the high purity limestone has little or no alkali content while the low purity limestone is quite high in alkalies.

The alkali content of our quarry materials calculates (assuming no loss in the kiln) to produce clinkers in excess of 1 percent alkalies as all Na_2O for normal slurry designs.

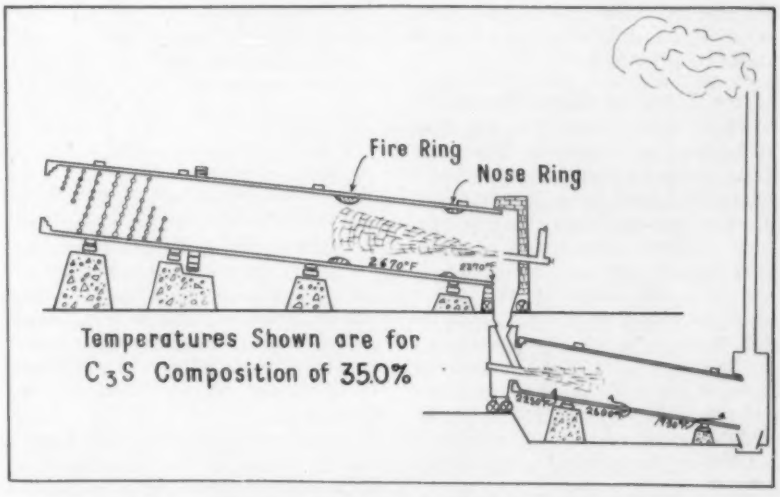
The matter of substituting a siliceous material low in alkalies to replace the "low" limestone, found two objections:

1—There was no such siliceous material locally available.

2—Good quarry operation for this type of deposit, dictates that "high" and "low" grade limestone be depleted close to the ratio they occur in the deposit.

These two objections were sufficient reason to abandon the hope of lessen-

(Continued on page 67)



Schematic diagram showing method of heat treatment of clinker

*All chemists with Yosemite Portland Cement Corp., Merced, Calif.

Rock Drill Lubrication

Part 2. Types of oilers required and the desired lubricant characteristics

By FLOYD R. ANDERSON*

Factors which determine proper lubrication of rock drills should be understood for the proper maintenance of rock drills. These factors consist of the mechanical devices used for applying the lubricant, the character of the lubricant itself and the care which the operator must take to ensure proper lubrication. They will be considered separately.

In the early days of rock drill manufacture, the only method of lubrication was an integral lubricator built into the machine. The integral lubricator essentially consists of a chamber for holding a supply of oil, which oil is fed through a metering device to the working parts of the drill. Throughout the years, improvement in the design of integral lubricators has been accomplished, but the limiting factor to their more universal success is the necessarily small capacity of the chamber. Due to the fact that the weight and size of a rock drill must be kept to a minimum, in some cases insufficient capacity of the oil reservoir is inevitable. It is a customary practice occasionally to pour oil into the air inlet of the machine to supplement oiling from the integral lubricator. In spite of all this, oiling under such conditions is haphazard at the best.

Two Types of Oilers Required

About 1924 the air line oiler type of lubricating device was introduced. This device consists essentially of a chamber, having a substantially greater volume than the integral oiler chamber, from which oil is fed into the air stream which actuates the drill. The finely atomized oil is carried to those parts over which the air stream passes, consequently a continuous supply of oil is possible. Some of the surfaces, however, which are not so directly exposed to the air stream may not receive an ample supply of lubricant. In this event, use of the integral oiler in conjunction with the line oiler should effectively take care of all of the parts. The integral oiler is usually of particular value in more adequate lubrication of the chuck parts at the forward end of the machine. Dual use of the air line oiler and the integral oiler is strongly recommended to ensure uninterrupted lubrication of all of the working surfaces of the machine.

Both devices were designed to supply continuously a small but adequate amount of oil while the machine is in operation. The use of a minimum amount of oil is dictated on the basis of economy and the fact that large amounts ejected with the exhaust are obnoxious to the operator. The amounts used are sufficient during operation but during long periods of idleness the thin film of oil does not always afford protection against corrosion. It is for this reason that before such periods of idleness it is recommended that oil be poured into the air inlet and into the chuck opening, running the machine thereafter only long enough to distribute the oil throughout the machine. This will effectively protect all of the parts from corrosive attack. For long periods of idleness, some operators completely disassemble the machine and pack the parts in grease for the same purpose.

Characteristic of Lubricant Determined by Operating Conditions

Satisfactory rock drill lubrication is dependent upon the quality of the oil. Considerable work has been done by oil companies and rock drill manufacturers to determine the necessary qualities in the lubricant itself, which will ensure desirable and effective results.

The viscosity of an oil is a measure of its ability to flow. A thick oil or one which flows slowly is said to have a high viscosity. A thin oil, which flows readily even at low temperatures, is said to have a low viscosity. Viscosity, of course, varies with temperature, oil flowing more readily at high temperatures than it does at low temperatures.

It is, for this reason, that viscosity considerations are inseparably linked with the temperature at which the drill is operated.

It thus becomes necessary, in the lubrication of rock drills, to employ oils of low viscosity when the machine is to be operated at low temperatures. In the event machines are to be operated at high temperatures, it may be necessary to use oils of high viscosity, in order that the flow may not be so fast that the oil is used up too quickly. If oil is too thin it is likely to pass through the machine too quickly, thereby preventing the necessary build-up of an oil film on the moving parts.

On the other hand, if the oil is too heavy it may not reach the parts situated some distance from the line oiler or integral lubricator. With these considerations in mind a guide is presented in the following table suggesting the proper selection of oil viscosity based on the operating temperatures of the rock drill.

Operating Temperature Range, Deg. F.	Recommended SAE Viscosity No.
20 and lower	10 or lighter
20 to 40	20
40 to 80	30
80 to 110	40
110 and higher	50

If an ample supply of oil is maintained in the line oiler or the integral oil reservoir, and if the passage ways have not become clogged, the use of an oil, having the proper viscosity, should ensure the presence of this lubricating medium on all of the parts of the drill. In order for the oil to exert its beneficial effects, it must be present on the working parts. Whether or not it will be present on the surface of the working parts will be determined to a very large extent by its viscosity or ability to flow.

The second most important property is that of film strength. Film strength is the measure of the load that a film of oil between two metal surfaces will sustain without breaking and allowing those surfaces to come in contact. A number of methods are used to determine the film strength of an oil.

While there is not yet established a standardized procedure for the measurement of film strength, the fact still remains that oils vary con-

*Chief Metallurgist, Gardner-Denver Co., Denver, Colo.

siderably in this property. The method used by the Gardner-Denver Co. makes use of a hardened steel bearing ring, mounted on a horizontally rotating shaft. A sample cup is placed below the ring so that the rotating bearing ring is dipping below the surface of the oil and is continuously coated with it.

A hardened and ground steel ball is suitably mounted so that it can be loaded against the outer ground surface of the rotating bearing ring. The ball is firmly clamped so that the action between the ball and ring is one of sliding, not rolling.

The load on the steel ball, applied through a suitable lever system, is increased by steps until seizure between the ring and ball indicate breakage of the oil film. Conditions involving temperature of the oil and rate of loading are maintained according to a standardized procedure. Hardness, composition, and surface finish of the ring and ball used in testing are for all practical purposes identical and correspond to the surface condition of the majority of the rock drill parts on which the character of lubrication exerts important effects. From the load value on the steel ball immediately prior to breakage of the film, the load in pounds per square inch that the oil film sustained without rupture can be determined.

Conducting this test on hundreds of different oils has demonstrated the following facts:

1. Duplicate tests on the same oil give results that agree.
2. Film strength will range from less than 850 p.s.i on some oils to more than 17,850 p.s.i on others.
3. Considering all of the oils tested, the film strength will, in general, fall in a range below 4000 or above 10,000 p.s.i.
4. In field results, the most satisfactory oils were those displaying film strengths in the higher range.

With these facts in mind it becomes apparent that it is highly important for prevention of scoring of rock drill parts in particular, to use only oils displaying high film strength.

It should be pointed out that film strength is a property entirely separate and distinct from the so-called "thickness" of an oil. Thus where a high film strength additive has been used, a thin oil will display as great a resistance to breakage, under load, as a thick, slow running oil. It thus becomes apparent that an oil of low viscosity for low temperature operation can be just as effective in preventing metal to metal contact as a high viscosity oil, suitable only for extremely high temperature of operation.

The development of film strength in an oil is accomplished through the addition of so-called extreme pressure additives. From results of testing made over a period of several years by the Gardner-Denver Co., it is recommended that rock drill lubricants should display film strength values in excess of 8000 p.s.i based on the test method described.

Oils for Wet Drilling

The third property of an oil which is important to satisfactory rock drill lubrication is its emulsifying ability. Shortly after the introduction of wet methods of drilling it was found that the lubricant used was frequently washed away from the surface of the parts, with the result that undue wear, corrosion and even scoring took place.

This condition gave rise to the development of oils compounded so that the oil would form an emulsion with the water present, instead of being washed away. Saponifiable additives, which could be any one of many animal or vegetable oils, develop the ability of an oil to emulsify with water. The addition of soaps to form so-called liquid greases appears to develop the same property. In the many commercial oils tested it has been found that the amount of saponifiable material may vary from a trace to a maximum of some 20 percent. In many cases it appears that little care has been taken about the amount of saponifiable material used, so long as an emulsifying action was developed.

The use of unduly large amounts is undesirable because of the fact that foaming in the line oiler will be likely to occur. Foaming results from the development of a stable emulsion or "suds" of oil, water, and air. This emulsion represents a diluted form of the original lubricant, a lubricant having only a fraction of the properties displayed by the undiluted oil. In the second place, foaming greatly increases the apparent volume in the line oiler so that inspection by the operator will indicate that the line oiler is apparently filled with lubricant, when in reality it is filled only with foam.

It thus is desirable to use an oil to which only enough saponifiable material has been added to develop a short-lived emulsion.

The A.S.T.M. Steam Emulsion test constitutes an accurate measure of the duration of an emulsion between the lubricant and water. The maximum life of the emulsion recorded by this test is 1200 seconds (20 minutes). In order that unduly stable emulsions will not be obtained, it is recommended that the duration of the emulsion obtained with rock drill oil should lie in the range of 100 to 600 seconds. This emulsion life is sufficiently great to ensure lubrication under wet conditions of operation, yet the emulsion will not be so stable that difficulty will be encountered due to dilution in the line oiler.

Miscellaneous but nevertheless important considerations in regard to the properties of a rock drill oil involve its freedom from foreign material, particularly dirt, which might interfere with the passage of the oil from the reservoir to the working parts, or which would have an abrasive action. It is also desirable to use oils having low acid values and corrosive characteristics to prevent corrosion of the parts by the oil. The use of a "drier" as the saponifiable or extreme pressure additive is not desirable due to the likelihood of depositing a gummy, varnish-like film on the running parts. Such deposits may interfere with the free movement of certain of the running parts, and further act as a carrier for abrasive particles.

The use of soap as an additive is not desirable, particularly in dry drilling operations. In such operations soap is frequently deposited on the running parts, where it acts as a vehicle for holding the abrasive rock dust which is often present. The combination thus develops an ideal abrasive for increasing the wear of running parts. In addition, so-called liquid greases are seldom truly fluid with the result that the feeding characteristics are erratic.

As a final factor in the matter of rock drill lubrication, the responsibility of the operator will be considered.

Obviously, the first consideration is the selection of the oil to be used. This must be based on an appraisal of the operating conditions and their influence on lubrication. Here it may be well to emphasize again that viscosity should be kept on the low side to ensure ready feeding of the oil to the working parts. A thick oil does not indicate high film strength. Thus,

(Continued on page 66)

GYPSUM

Research Contributes to War Production

Development of many new products and opening of new war-time markets for old products have enabled the National Gypsum Co. not only to contribute directly to victory, but also to keep a seasoned organization intact for postwar activities

Blackstone Studios
Melvin H. Baker

By MELVIN H. BAKER†*

TWO YEARS AGO the National Gypsum Co. was engaged solely in the manufacture and distribution of wall and ceiling building materials. Within the short space of 12 months (written last summer), our organization has adapted itself to changing conditions and requirements, and is now engaged in producing various materials needed directly or indirectly in our war effort. Furthermore, we are continuing to do everything possible to turn our facilities to similar uses.

The job of conversion from peacetime to war business has not been easy. Plants equipped for the manufacture of gypsum plaster, wallboard, lime, rock wool, and similar items are not adaptable for other types of production. However, the company's staff of technicians, engineers, and chemists have developed many new products that can be processed in our chain of 21 mills and also have opened new wartime markets for old products.

Our problem has three phases. First, we are eager to devote all of our facilities to the job of winning a decisive victory. Second, our plants must be kept operating throughout the war. Third, we must keep our organization intact for the resumption of normal business after the war.

All three of these important objectives can be attained through increased war production. But there is a limit to the amount of building that is required by the war activities. Cantonments, barracks, houses for defense workers, industrial plants —all must be built speedily. But when these structures shall have been completed, the military market for building materials will dry up.

Moreover, the government, in its efforts to conserve metals and other critical materials, has placed severe restrictions on civilian building. Thus the market for building materials will continue to shrink throughout the war. This market must be supplemented with other markets which will increase in size as the war progresses. Only by finding and developing those markets can we hope to keep our plants running and our organization intact for the duration of the war.

Thus the problem is one of developing new products that can be made with existing equipment and of creating new plants to utilize our production organization. This article summarizes what has been accomplished through concentrated research by our chemical and engineering staff.

We directed our attention first to the company's metal-lath production. This plant fabricates sheet steel into perforated and expanded metal-lath, arch bead, corner bead, and other metal plaster bases. This was the first of our plants to feel the pinch of priorities and consequently the first to be converted.

New Uses Found

Our metal technicians canvassed Washington to find needs for metal items that we could manufacture. After several months of research, they developed a system of laying out thousands of feet of perforated metal to make landing fields. They also developed an acoustical treatment for buildings that are used for testing airplane motors, this treatment making use of sound-absorbent rock wool, which we also manufacture.

These two products are now in production. Orders for landing mats and perforated boxes have already been received in substantial volume. Within the next six months we hope to book orders for these and other items now being perfected.

The company's four lime mills represented a much more difficult conversion problem. Lime is quarried, burned, ground, and packaged. The plant facilities used for processing lime are not readily adaptable to other types of production. Therefore, it was necessary to find new markets for the lime.

Three of these lime plants are located in areas abundant with high calcium lime of unusual purity. Properly processed, this lime is needed for the fluxing of steel, for the manufacture of rubber and plastics, and for use in many chemicals. At certain plants, several thousand dollars worth of new equipment was installed to process a high-calcium lime of very high chemical purity. At one of them, for example, was installed a rotary kiln in which lime can be burned slowly and evenly as is necessary for its use in a great many essential chemicals.

As a result of this program, three of our lime mills are being utilized. The fourth lime mill is located in the heart of the dolomitic limestone region. This lime, while excellent for building purposes, is not chemically

*From the Executives Service Bulletin, Metropolitan Life Insurance Co.
†President, National Gypsum Co., Buffalo, N. Y.

suited for the manufacture of steel, rubber, and plastics. An entirely different program is being worked out for it.

Our chemists, working with the chemical engineers of other large companies, have developed a wholly new product involving the uses of burnt dolomitic limestone. If present tests confirm the process, an additional plant will be built adjacent to this lime mill.

Rock wool, too, is made by a process involving massive equipment of little value for any other type of production. To keep our three rock-wool mills busy, we were forced to find new markets.

One of these is in the cold-storage field. In connection with the government's military program, new buildings are needed for the storage of food and other perishables. In the past it has been the practice to insulate these buildings with cork. Today, with importations greatly curtailed, a new market has been created for the rock-wool manufacturer who can develop a suitable product.

Our heating engineers and insulation technicians have developed a new type of rock wool which meets the standards and can be produced and sold at low cost. We expect that, after the war, we shall continue to enjoy a large market for this material.

Accepted for Merchant Ships

The combined efforts of sales and engineering have developed a type of rock wool accepted for insulating merchant vessels. Every merchant vessel requires insulation for cold storage. We anticipate a fair volume from this source as long as the war lasts.

These two new rock wool products, combined with home insulation for fuel-saving in old homes, will occupy the capacity of the rock-wool mills for the duration.

The problems of converting nine gypsum mills were more complex. A gypsum mill, like those processing lime and rock wool, requires special and large equipment unsuited for other types of production. To keep our gypsum mills active it has been necessary to supplement sales to the dwindling building market with the development of new products and new uses.

We have partially accomplished this by developing a plaster suitable for making small metal castings. The process has been found to produce a better casting with a smoother surface. This market will probably become a permanent outlet after the war.

There has also been developed a plaster for forming bullet-proof gasoline tanks. This will absorb some of our available plaster volume.

But the special plasters needed for moulding purposes represent only a part of the company's production capacity. To date we have not discovered any large-volume uses for plaster outside of the building field. Our gypsum mills may operate on a reduced scale after the government's present building program has been completed.

Because of this, it seemed necessary to make other plans for the disposition of our gypsum-production organization. This is being accomplished by the development of war-production plants to be operated by the National Gypsum Company.

The company negotiated a contract with the War Department to supervise construction of and to operate a munitions plant. This development naturally will be an important factor in victory production. It will also enable the company to maintain many of its key production executives who might otherwise be lost to the operating organization after the war. In addition to the keymen, we have taken scores of technicians, supervisors, and engineers from other of our gypsum mills and assigned them to the munitions plant for the duration of the war.

This group will be the nucleus of the organization needed for this production unit. All are men who have had long careers with our company, having risen through the ranks to positions of responsibility. They know their jobs; they know the methods and policies of the company. And when the war is over, they will be in a position to take up their old jobs and carry on their normal careers.

Our managers, supervisors, and technical men in each case started at the bottom as young men and over the years came up through the line, where they acquired full knowledge of the fundamentals of the business. More important, they developed an acquaintance with their fellow workers all along the line and an understanding of their various temperaments. This experience of working together intimately has enabled us to convert with a minimum of friction, from production of wallboard to munitions.

Of course, certain preparatory work is necessary when taking a supervisor into an entirely new line of business. We approach this first by giving the man a clear understanding of his new duties. He is next sent to the job for a study of the work, and this is later followed with a period of intense training. The method and duration of this training has been governed wholly by requirements of the new job. For example, shifting to a new plant onto a similar type of machine requires little planning, except for procedure and maybe different safety needs, while going from a gypsum mill into a munitions plant requires complete training under a program that has been previously researched and completely planned by the top management.

Our experience has shown that it is advisable to "sell" the organization in any important departure from our recognized lines. In each case we have been successful in convincing our people of the importance of this as a means for keeping the organization intact.

Then there is the need for quick war production and the importance of all our people in supervisory capacities to the future of our business. In such a program, management has made it possible for the organization to contribute more directly the things necessary to win this war, and at the same time acquire experience that will be beneficial to them individually after the war.

We are working on many other projects and intend to keep right on looking for new opportunities. After the war there will be a tremendous market for everything, and we want to benefit quickly from it. Thus when victory has been won, we expect to have an organization seasoned and equipped to meet the many problems then presented.

Limestone Needed for Tin

CONSIDERABLE quantities of limestone or lime are used as reducing agents in preparing Bolivian tin ore concentrates for the smelter. This new smelter in Texas is said to have sufficient capacity to supply all the tin needs of the United States.

Award to Sand Company

SCHMIDT BROTHERS SAND & SUPPLY CO., Cleveland, Ohio, received an award from the Ohio Safety Congress recently for achieving the best safety record among Ohio sand and gravel companies.

DIVERSIFICATION

From Boats to Aggregates

Parker Bros. & Co., Inc., Houston, Texas, builds its own boats, produces sand and gravel, dredges shell, and batches ready mixed concrete and shell road mix

PARKER BROS. & CO., INC., of Houston, Texas, are producers of sand, gravel, shell, ready mixed concrete, and are manufacturers and builders of steel barges, Diesel tugboats and similar maritime equipment. Their main yard at 5303 Navigation Blvd. is a neat and well arranged establishment.

Sid Clark, field engineer with Parker Bros. & Co., Inc., when asked about the nature and amount of their shell production and sales, said:

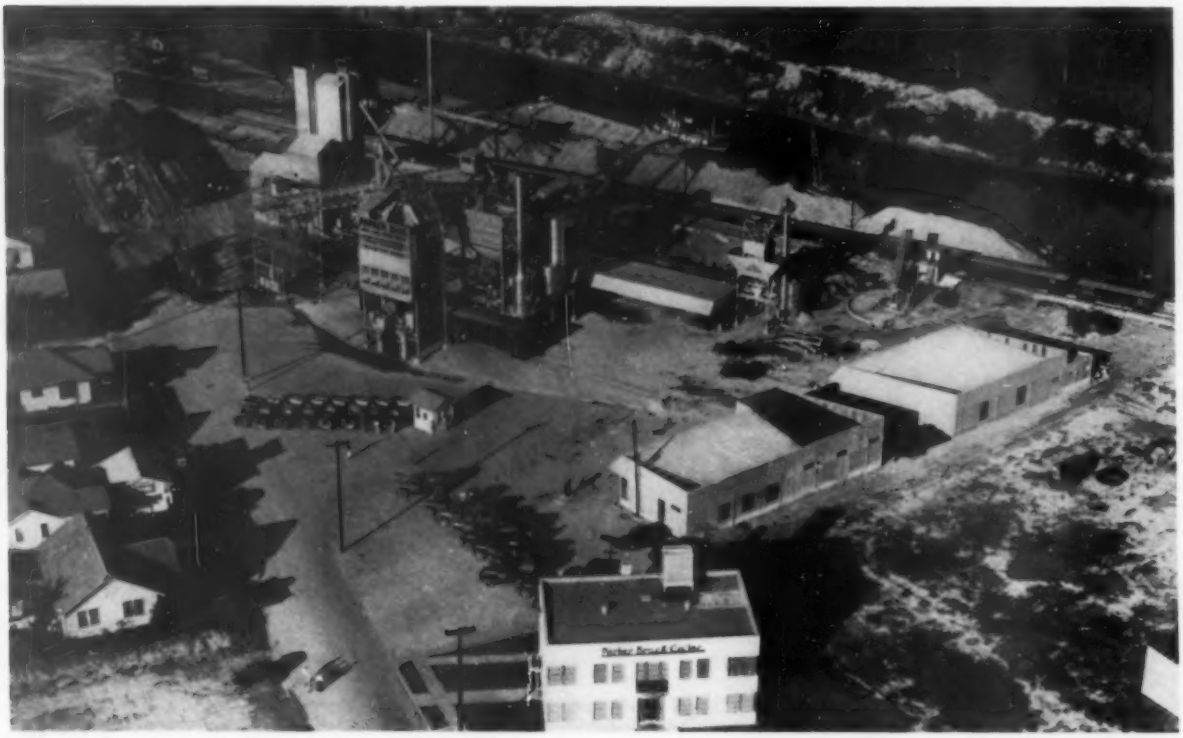
"The major portion of our plant and equipment is devoted to the handling of mud shell, so named from the fact that it is dredged from reefs of dead shell which have accumulated on the alluvial bottoms of the bays and estuaries along the Gulf Coast.

"Our material is obtained by a dredge equipped with a 15-in. Diesel electric pump and washing and sizing screens which load about 500 tons per hour to barges alongside, two sizes being produced and loaded simultaneously.

"The newer barges we manufacture and use are of steel and have capacities of 700 to 1400 cu. yd. each.

"The barges are towed to destination in tows of two and three barges, deliveries being made to many points along the Intercoastal Canal and the Houston Ship Channel. Our shell is used as raw material for cement plants, lime plants and paper mills. We are making a direct contribution to the war as our shell is now being delivered in large tonnages to two large magnesium plants. Two crushing plants producing poultry feed and specialties also use our shell.

"That part of the production delivered to the Houston plant is dis-



Airplane view of Parker Bros. plant and office layout. In the center foreground is the ready mixed concrete and the shell road mix units, bunkers and stockpiles are shown along the canal, and the modern office structure is in the immediate foreground

Barges and tug boat along docking facilities of plant. Note the concrete wharf and large stockpiles of shell and sand and gravel

tributed to two silos and three compartment bins over the scales. The shell is used in road building, concrete aggregate and aggregate for asphaltic wearing surfaces.

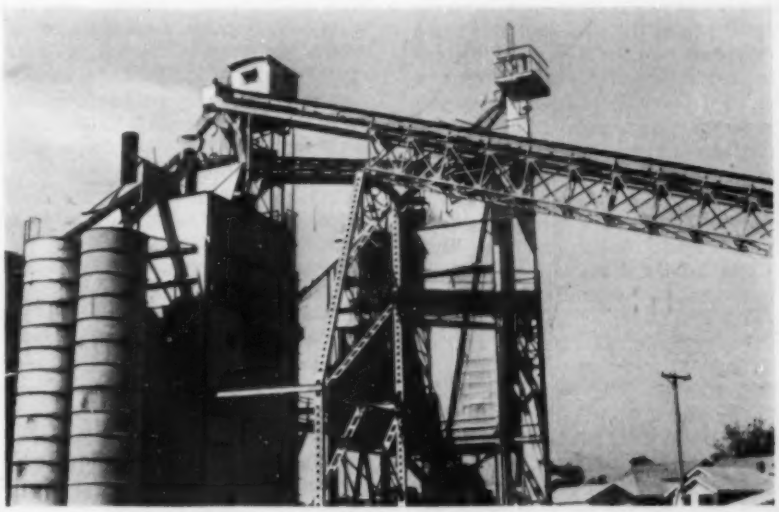
"About 50 percent of all the concrete used in Houston is shell concrete, including practically all city paving, it having proven more satisfactory on local streets than any paving materials we have cheaply available in the district."

Ready Mixed Concrete Plant Is Busy

The ready mixed concrete plant has been one of the very active spots of a busy city. It was only a few short years ago that many people in Houston smiled behind their hands when the promoters of Houston's Ship Channel said smokestacks of industries would clutter the Channel for its length of some 20 miles. But Houston's natural location, its oil, its war industries and its progressive citizenry have made those promotional words come true. The city doubles its population regularly every 10 years and the metropolitan area comprising greater Houston has a population of 625,000.

A project here nearing completion, possibly a new aggregate, that is of interest to rock products industries, is the new steel blast and open hearth furnaces of the Sheffield Steel Company. This huge plant will receive iron ore from north central Texas where there are beds of iron ore that blanket an area covering several counties. No stripping will be required and the beds are from 8- to 20-ft. thick. It will require a haul of about 180 miles. Coke will be prepared at a new plant being built and the gas resulting from these kilns will find an outlet in at least one cement plant. New limestone quarries are being opened up and proposals are afoot for slag aggregate plants and probably a lightweight aggregate processed from slag (Superock). Costs of manufacture of steel will compare favorably with Birmingham and the Northern steel centers, so this plant will be a permanent fixture and a real war asset.

The ready mixed concrete plant uses a 2½-cu. yd. Smith mixer. This



Close-up of ready mixed concrete and shell road mix plants. All structures are of steel and concrete

Tug and barge construction yards operated by Parker Bros. & Co., Inc.

plant, which has been in operation three years, has a fleet of mixer trucks that has increased to a total of 26 Rex mixers ranging in size from 2-cu. yd. to 6-cu. yd. capacity.

Cement is delivered in bulk and storage space is provided for three brands of cement and seven sizes of aggregate. The scale hopper for aggregate is much larger than most plants as shell is sometimes weighed in this plant.

Shell Road Mix Plant

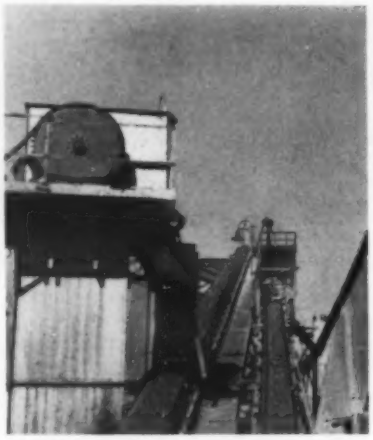
Adjoining the ready mixed concrete plant is the plant for preparing the "cement stabilized pug mill shell" and the "asphalt coated shell wearing surface." These are materials developed by Parker Bros. & Co., Inc., on which they have and own patents. The former is a foundation course composed of clean shell, processed by grinding in a pug mill with cement and water. The pug mill partially disintegrates the shell and provides a void filler. About 8 percent cement is used with water ranging from 10 to 17½ percent, including absorbed water in the material. This gives a dry mix which is delivered to the job in trucks and spread evenly over the grade. The stabilized pug mill shell is then rolled and compacted with a 3-ton (or larger) roller until it is a hard and stable road base for receiving the asphalt coated shell wearing surface.

The asphalt coated shell wearing surface consists of graded oyster shell from ¾-in. down to dust. To this is added 20 gal. of No. 230 asphalt per ton of shell. It makes a very desirable and long-lasting road surface that is not slippery, wet or dry. It is fast gaining in favor in the South.

Builds Its Own Boats

Sand and gravel, as well as shell, are delivered to the yard by tugs and barges that are company owned and even manufactured by the company. This enterprising company could not get suitable delivery on barges and towboats, so they established a shipyard of their own. It operates under the name of the Parker Bros. Shipyard. Here they are turning out oil barges, shell, sand and gravel barges, tugboats, etc. Construction of the yard goes forward with the construction of barges and boats. Truthfully the barges are being built faster than the shipyard, but the latter is fast becoming a well established, permanent yard for building and repairing maritime equipment. It is located on Industrial Road across Green's Bayou from the rotary lime plant built by W. D. Haden Co.

The shell barges are unloaded by a



Conveyor belt at right supplies shell for a poultry feed grinding company operating adjacent to plant

Lorain "75" shovel, sand and gravel by a General Excavator "Invincible." Both are clamshell rigs. These materials are stockpiled separately over parallel reclaiming tunnels. The shell tunnel is about 500-ft. long with a 30-in. belt conveyor operating in these tunnels. Cross-belt conveyors receive, elevate and deliver the aggregates (or shell) to Butler bins or silos over the mixing plants. For the sand and gravel, a Chain Belt bucket elevator is part of the reclaiming system.

Near the Parker Bros.' shipyards a dry batching plant has been assembled to give quicker and more efficient service to its many customers in that fast growing industrial part of greater Houston.

That this company will continue to grow and expand goes without saying, for they have their "ears to the ground" for new developments, are seeking new processes and methods themselves. But, above all, there are five Parker brothers themselves, all hard workers and pulling together for the company's good. One is not in Houston long before one is told, "It's a hell of a good outfit." That's what Houston's people think of them, and so do we.

Open Talc Plant

NORTHWEST TALC & MAGNESIUM CO., Clear Lake, Wash., has started quarry and plant operations. Carl Field is president and F. E. Pegg is general superintendent.

Drill Lubrication

(Continued from page 61)

if a variety of operating temperatures are encountered, select the oil for the lowest temperature, not the average or the highest. The thin oil will feed to the parts at both the high and low extremes of the temperature scale.

Select an oil having high film strength to ensure protection against high sliding pressures even though heavy loads may be only occasionally encountered. For wet types of operation an emulsifying oil is essential.

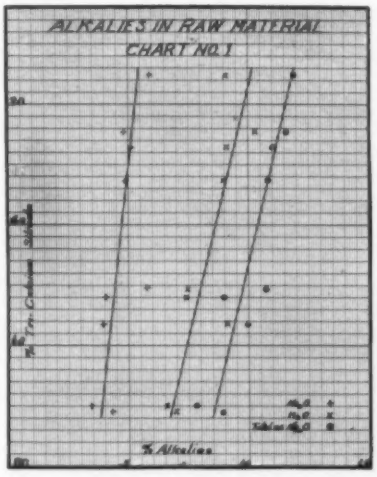
Checking the Lubrication

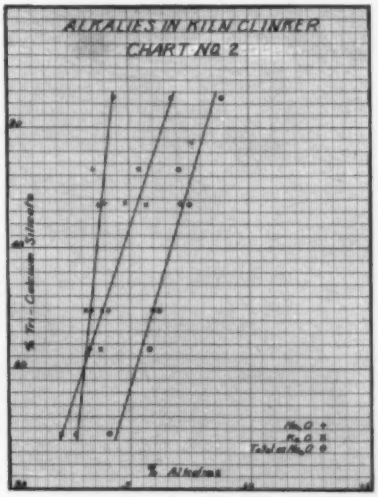
After careful selection of the oil it will be the duty of the operator to ensure its presence on the working surfaces. This involves maintenance of oil in the line oiler and integral oiler at all times. A scheduled filling of the oiler chambers, based on a knowledge of the rate at which they become empty, is the safest procedure. Here again it is important to warn that the presence of a foam in the line oiler does not indicate the presence of the lubricant as such but, instead, the presence of a diluted lubricant whose properties have been seriously impaired.

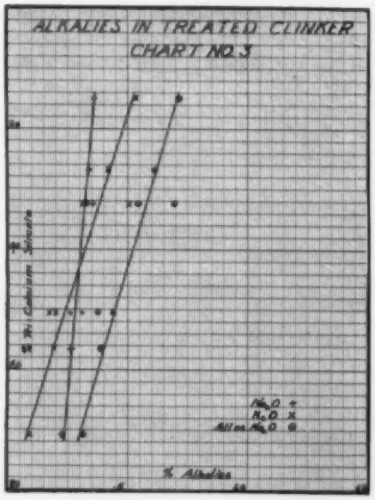
An experienced operator can continuously check the feeding of oil by the oil film which should form on the shank of each drill steel used. If a shank fails to accumulate an oil film on its surface, sufficient oil is not being fed to the machine. An indicated deficiency of oil may be corrected by increasing the feed adjustment of the line oiler. It may also be necessary to alter the metering device of the integral oiler by suitable adjustment or a change of the metering pin. The appearance of the shanks removed from the machine are an accurate barometer of lubrication.

If, on completing the round, the machine is to be left idle, a generous introduction of oil into the air inlet and chuck opening of the machine is cheap insurance against corrosion. A momentary operation of the rock drill will serve to distribute the oil so applied to all of the working surfaces.

While these suggestions may appear elementary, they are prompted by the frequent occurrence of prematurely worn, corroded and scored parts submitted with claims for replacement, due to the belief by the operator that the parts are defective.







Charts 1, 2, and 3 which show decreasing amounts of alkalies from raw materials to the heat-treated clinker

(Continued from page 59)

ing alkalies by replacement of raw materials outlined in Case 1.

In studying Case 2, we made several plant trials with the addition of calcium chloride to the slurry. We found six pounds per barrel effective in lowering the alkali content of the clinker to a desirable minimum but the cost of the material and handling as well as other considerations made this method undesirable.

We now found we must consider and study the principles of Case 3 for alkali removal.

The current specifications for low-heat cement require that the C_3S be not greater than 35 percent and the C_3A be not greater than 5 percent. This meant we must add iron in some form to a low C_3S design. In the burning process these changes dictated lower clinkering temperatures which in turn were conducive to higher alkalies in the discharged clinker.

The analysis of our raw materials showed the alkalies ranged from 1.2 percent to 0.8 percent (ignited basis) total as Na_2O from "low" limestone to "high" limestone.

Eight Trial "Burns" to Obtain Ideal Heat Treatment

We made eight separate plant trial burns of varying composition. The hot kiln discharged clinker from each burn was passed directly through the treater for reheating treatment. Analysis of the kiln feed slurry, kiln clinker and treated clinker were made for K_2O, Na_2O as well as compound composition.

The two plant trial kiln burns for the extreme compound composition designs (15 percent and 71 percent C_3S) extended over a period of 48 hours each. For the other designs much longer burning periods were maintained. During these long burning periods we maintained a desirable quality clinker with a fair average kiln operating condition. For this reason the alkali results are probably somewhat higher than would have been the case if a short trial had been made with every effort to produce ideal clinker. Samples of "raw mix," "kiln clinker" and "treater clinker" were taken continuously during the trials.

The following tabulates these eight raw mix designs showing C_3S, K_2O, Na_2O and the total alkalies as Na_2O (ignited basis).

TABLE I—RAW MIX DESIGNS

C_3S	K_2O	Na_2O	Total as Na_2O
15.0%	.906	.590	1.19
27.0%	.909	.513	1.10
32.4%	N.D.	N.D.	N.D.
32.5%	.899	.488	1.08
50.6%	.745	.579	1.07
50.7%	N.D.	N.D.	N.D.
56.5%	.911	.397	.966
71.1%	.698	.430	.889

The above results are shown graphically in Chart I.

Mix design 32.4 percent and 50.7 percent C_3S were not analyzed for alkalies because of parallel designs. However, three additional analyses for our raw material were made by another laboratory. These results follow and are included in Chart I.

C_3S	K_2O	Na_2O	Total as Na_2O
24.5%	1.03	.484	1.16
52.0%	.742	.402	.896
70.0%	.659	.345	.779

The C_3S, K_2O, Na_2O and total alkalies calculated as Na_2O in the kiln clinker for each of the eight designs are shown in Table II.

TABLE II—TOTAL AKLALIES IN CLINKER

C_3S	K_2O	Na_2O	Total as Na_2O
15.0%	.682	.441	.890
27.0%	.543	.351	.708
32.4%	.482	.399	.716
32.5%	.572	.373	.752
50.6%	.386	.344	.598
50.7%	.315	.412	.619
56.7%	.376	.331	.578
71.0%	.212	.272	.411

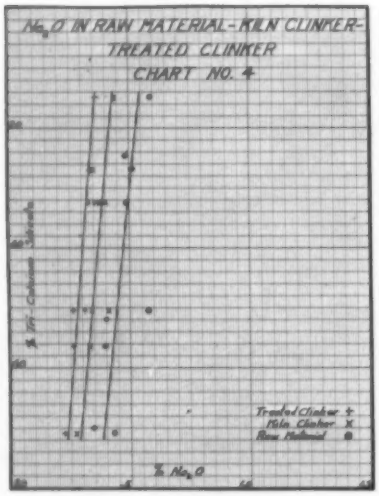
These results are shown graphically in Chart II.

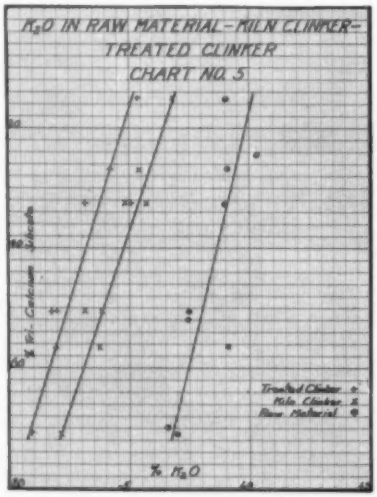
The heat treating temperature of these eight plant trial burns, varied somewhat with the clinker design. In general the temperature history of a clinker of 35 percent C_3S design during burning and treating, was very close to the following:

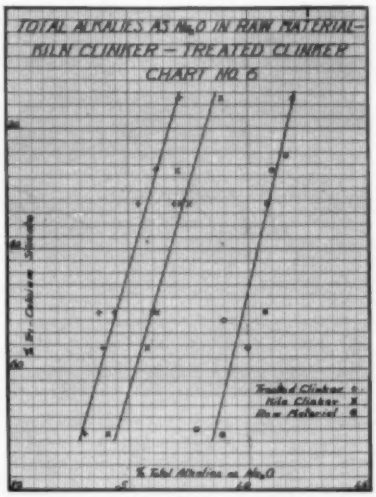
Kiln burning temperature 2670 deg. F.
Kiln discharge clinker... 2370 deg. F.
Treater clinkering
feed section ..... 2230 deg. F.
Treater re-heating zone. 2600 deg. F.
Treater discharge section 1930 deg. F.

In maintaining the above temperature conditions in the treater, it was necessary to have a heat input into the treater of approximately 380,000 b.t.u. per barrel.

Each of the eight trial burns were heat treated continuously as they left the kiln. For the higher C_3S designs it was necessary to increase the kiln burning temperature and at the same time the treater reheating zone temperature was increased proportionately to maintain approximately a 70 deg. F. differential.






TOTAL ALKALIES AS Na_2O IN RAW MATERIAL–KILN CLINKER – TREATED CLINKER
CHART NO. 6
% Tri. Calcium Silicate
% Total Alkalies as Na_2O

Charts 4 to 6 show graphically the results of eight trial "burns" in reducing alkali percentage. Chart 7, below, bin acceptance results

The following tabulates the eight designs together with the K_2O, Na_2O and total as Na_2O in the treated clinker.

TABLE III—ALKALIES IN TREATED CLINKER

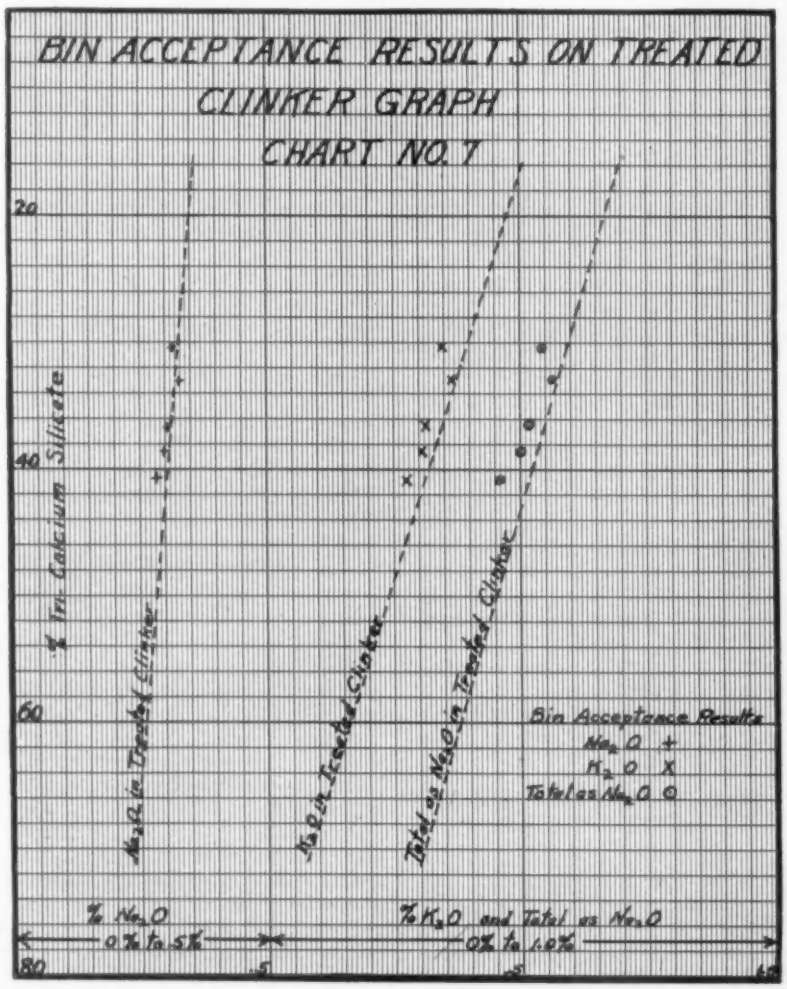
C_3S	K_2O	Na_2O	Total as Na_2O
15.0%	.537	.363	.716
27.0%	.421	.339	.616
32.4%	.318	.332	.541
32.5%	.508	.358	.692
50.6%	.199	.311	.442
50.7%	.174	.263	.377
56.7%	.193	.263	.390
71.0%	.090	.225	.315

These results are shown graphically in Chart III.

For a different method of comparison we replotted the results of Charts I, II and III to show Na_2O in raw material, kiln clinker and treater clinker in Chart IV. A like comparison for K_2O and total as Na_2O are shown in Charts V and VI respectively.

The interesting detail shown is the large degree to which the K_2O is driven off in the kiln and treater and the lesser degree to which the Na_2O is affected.

It will be noted from the charts that for a 40 percent C_3S design the K_2O was decreased .39 percent from the raw material to kiln clinker and .16 percent during treating, while the Na_2O was decreased .10 percent from the raw material to kiln clinker and .07 percent during treating. Perhaps it would be better to show this percentage alkali decrease progressively in the form of a table, as follows:



	Raw Mix (Ignited Basis)		Kiln Clinker	Percent Loss	Treated Clinker	Percent Loss	Total Percent Loss
40% C_3S	K_2O	.865	.476	45.1%	.320	33.7%	63.0%
	Na_2O	.475	.375	21.1%	.305	18.7%	35.7%

Comparing the percentage loss for the Na_2O from raw material to kiln clinker with that of the percentage

(Continued on page 74)

PRINT IN BINDING

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INS FOR STORING, HANDLING R BATCHING MATERIALS . . .

ave been placed under government egulations in order to help win the ar. Our entire production has been armarked for vital war effort con-ruction.

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omplete information is available on uck Loading Bins and Circular Stor-ge Bins from 35 to 300 tons for sand gravel . . . Portable Aggregate tching Bins from 35 to 100 tons ca-acity for batch truck or truck mixer harging . . . Portable and Semi-Port-ble Bulk Cement Batching Bins from 0 to 750 bbls. capacity . . . Perma-ent Aggregate or Combination Ag-regate and Cement Batching Plants om 100 to 400 tons capacity with tchers up to 5 cubic yards . . . Ce-ent Tanks for storing, batching or re-ndling systems from 300 to 1500 bls. capacity.

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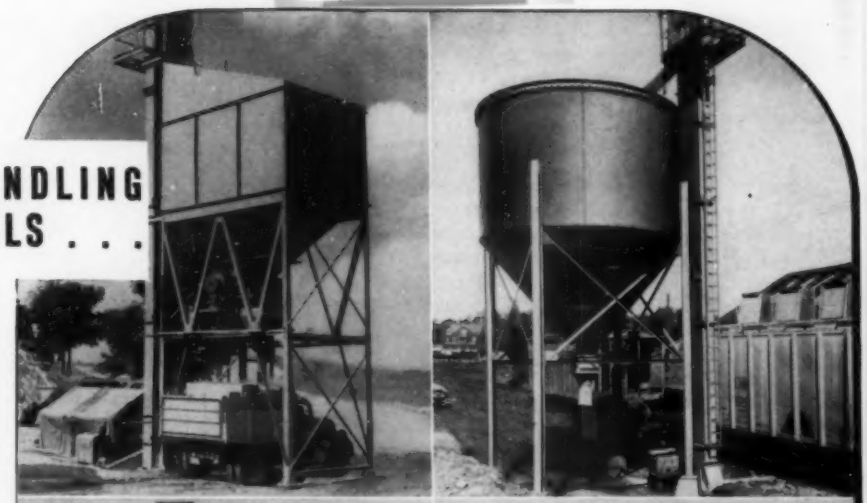

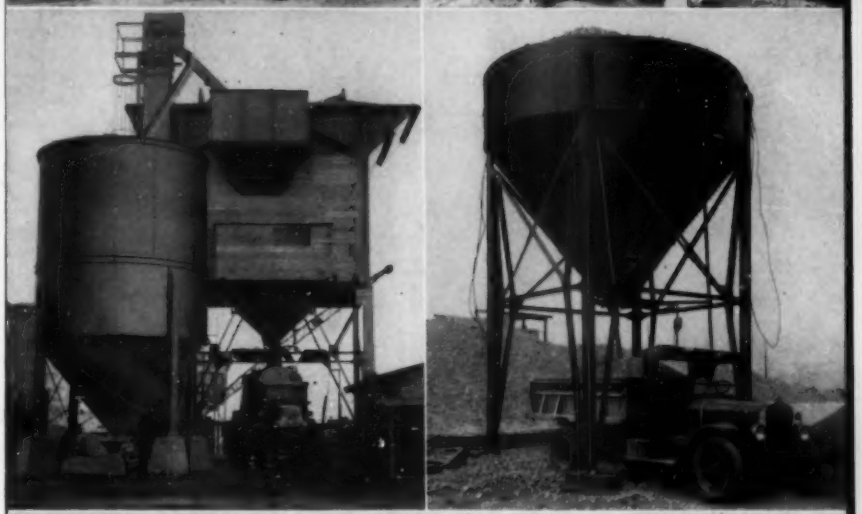

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WARREN, OHIO · U. S. A.

Washington Doings and Regulations

THE TEMPO in the issuance of new rules and regulations appears to increase as the war goes on. Of course, the most important at the moment are the rules and regulations regarding deduction of 20 percent tax on incomes as earned. This looks as if it would provide jobs for a few million new accountants on both the employers' and the government payrolls. Since all employers have first-hand instructions, we pass over these and note some of the other things that have come through the mills in the last 30 days.

Critical Construction Materials

O.W.I.-1993: W.P.B. regulations provide that after July 1 controlled materials can be acquired only by means of a C.M.P. allotment rather than through a preference rating order as heretofore. Controlled materials used in war housing construction include concrete reinforcing bars, steel pipe, steel wire and wire products including nails, and copper wire and cable.

Builders holding preference rating orders for privately financed war housing can secure a C.M.P. allotment by filing Form C.M.P.-H-1 with the local field office of the Federal Housing Administration, one of the operating units of the National Housing Agency. This form represents the builder's application for an allotment of controlled materials in accordance with the approved quantities shown on the bill of materials which is made a part of his preference rating order.

Execution of Form C.M.P.-H-1 by the F.H.A. office will also authorize the builder's construction schedule and will include an assignment of an AA-3 preference rating for obtaining lumber and metal products other than controlled materials.

Form C.M.P.-H-1 contains instructions for the completion and filing of the application for an allotment. Copies of this form can be secured from F.H.A. field offices or W.P.B. district offices. F.H.A. field offices will also supply builders with any additional information in completing the forms.

Contractors building publicly financed war housing projects will follow the same procedure, except that their contract must be with the field office of the Federal Public Housing Authority having jurisdiction over the project.

The National Housing Agency acts as claimant agency for war housing under the Controlled Materials Plan. The N.H.A. will therefore assign preference ratings and allot controlled materials for all war housing.

Under this procedure, builders seeking approval for privately financed war housing construction file with the local F.H.A. field office a PD-105 application form and a PD-105A form which lists the materials needed for the proposed project. Such applications can be approved only in areas where a local N.H.A. quota for privately financed war housing is available.

Gasoline Rations in East

O.D.T.-283: A revised industry list replaces the original list announced May 30.

Essential industries on the original list are recast, with some additions, into four groups: AA-1 (Most Critical); A-1 (Very Critical); A-2 (Critical), and A-3 (Important).

As long as the supply of gasoline in the East remains critical, lesser amounts may be allocated to the lower rated industries than to the higher.

Item 12.21 is mining, milling, smelting and refining non-metallics is classified as A-1; and Item 12-22 is mining and milling, smelting and refining of other minerals and metals as A-3. The distinction is not very clear.

Should Turn in Unused Construction Equipment

W.P.B.-3877: Methods of attracting idle machines into the normal channels of distribution for resale were discussed at length by the Used Construction Machinery Industry Advisory Committee with W.P.B. and other Government officials in Washington.

It was pointed out to members of the Committee that many contractors who had worked on army camp construction are holding large stocks of equipment in idleness in the expectation of further construction.

The critical repair parts situation and the problems of reconditioning and general repair, they stated, particularly affect the putting of used equipment to work.

O.P.A. Advisory Committees

O.P.A.-2654: Rapidly extending the use of industry advisory committees, the Office of Price Administration recently set up machinery for the formation of advisory committees to cover all industries affected by O.P.A. price regulations.

While the Price Control Act requires O.P.A. to set up advisory committees on the request of representatives of an industry, under the policy inaugurated by Mr. Brown, advisory committees will be set up for all industries whether or not a request has been made. At present, 92 industry advisory committees have been formed. Even for industries where formed advisory committees have not been set up, O.P.A. has consulted representatives of industry in the preparation of price regulations.

Paper Sack Limitations

W.P.B. Limitation Order L-279 prohibits sack manufacturers from making other sizes than the following:

Cement (standard portland) 94 lbs.

Plaster (gypsum) 2-5-10-25-50-100 lbs. (gross weight).

W.P.B. Conservation Order M-221, as amended June 11, applies the same limitations on textile bags.

Construction Machinery Repair Parts

W.P.B.-3848: The certification "in a writing" required under Limitation Order L-192 before a purchaser can obtain construction machinery repair parts to meet an actual or impending breakdown may be made in the form of a telegraphic certification, M. B. Garber, Acting Director of W.P.B.'s Construction Machinery Division stated today.

According to Mr. Garber, a telegram is "a writing" and is, therefore, a proper certification for the purposes of L-192, providing it contains the information that the order requires to be set forth in such certification.

Mr. Garber pointed out, however, that if a telegraphic certification is made in such cases where the purchaser is using a preference rating assigned by C.M.P. Regulations 5 or 5A or any preference rating order in the "P" or "U" series, that also require certification, the purchaser must further note on his telegraphic certification the source of his rating and add the statement "ratings certified."

The purchaser also must keep a copy of the telegraphic certification in his records signed by him as provided in Priorities Regulation No. 3.

(Continued on page 72)

IN WAR PROJECT CONSTRUCTION

In wartime, more than ever, it's the power and speed that counts. Koehring speed and power saves seconds in shovel operations . . . the surest way to increase production. Victory demands a greater output, and Koehring Shovels have the reserve power to provide it. The wartime service needed is available in your Koehring Shovel with little time out for breakdown or repair. Be sure to keep your shovel well lubricated . . . replace worn parts before failure . . . never misuse your shovel in any way . . . and it will exhibit a performance that counts in increasing production.

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Depend on your Koehring distributor to help you keep your equipment operating. Care for your Koehring equipment NOW, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

Washington Doings

(Continued from page 70)

O.P.A. Directory

O.P.A.—2482: A new directory of Commodities and Services designed to help persons contacting the Office of Price Administration to find the unit which has specific knowledge of their problems was published May 11.

The directory indicates the price regulations applicable to each commodity and class of services, and the O.P.A. unit which handles it. By use of an alphabetical list of commodities the visitor to O.P.A. can easily find the individual he is seeking and his telephone extension number. The commodity list covers a total of 5,000 items. Items affected by rationing orders are annotated.

The current issue is the first of the directories to be made public. The publication will be revised and reissued periodically hereafter. Rationing regulations and the personnel of the organization administering them are included for the first time in this issue.

Include Marine Transportation Under CMP Regulation 5

Executive Secretary V. P. Ahearn has advised that because of the W.P.B. Mining Division's policy of confining P-56 to sand and gravel production facilities, companies using the navigable waters of the United States had difficulty in respect to preference rating authority for marine equipment used in the transportation and handling of finally processed materials. It was held that P-56 could not be used for equipment engaged in transporting finally processed materials. The procedure declared to be valid by a regional office of W.P.B. was to consider CMP Reg. 5 as a source of priority authority under the "Ship repair and maintenance" classification.

Price Increase on Hudson River Brick

O.P.A. Amendment No. 5 to Order No. A-1 under section 1499 159b of Maximum Price Regulation No. 188 granted Hudson River (New York) clay brick manufacturers a price increase on common brick from $13 to $14 per M, effective April 28. The amendment also provided that any person purchasing and taking delivery of Hudson River common brick in the Metropolitan New York City area, as defined in the amendment, for resale in substantially the same form, may add $1.00 per M and $1.25 per M, respectively, to his maximum price for each class of purchaser of standard size Hudson River common brick and oversize, or jumbo, brick as determined under the General Maximum Price Regulation.

Receipts for Tires and Repair Parts

O.D.T.-289: Commercial motor vehicle operators were relieved today from the provisions of the Office of Defense Transportation's General Order 21 which required them to sign receipts for gasoline, parts, tires or tubes and to endorse the receipts with their Certificate of War Necessity number. Commercial motor vehicles include trucks, buses and taxicabs.

The O.D.T.'s action was taken in an amendment to Order 21 which revised section 501.96 by eliminating paragraph (b) and consolidating paragraphs (a) and (c) into one paragraph.

Agricultural Construction Permitted

W.P.B.-3815: The types of construction for which applications are processed in Regional Offices were enlarged in an amendment to field administrative order 708-20, the War Production Board announced today. This order delegates authority to Regional Directors to permit construction under Order L-41 and to issue preference rating orders provided the estimated cost is less than $10,000.

Among the types of construction now processed in the field are those which increase by less than 20 percent the capacity of productive facilities and off-farm storage facilities for agricultural products, including drainage and irrigation facilities serving more than one farm, creameries, warehouses and grain elevators.

No Price Limitations on Chicken Grits

O.P.A. Amendment No. 7 to Revised Supplementary Regulation No. 1 to G.M.P. regulation, because effective June 3: Rock grit or crushed stone used as poultry feed has been exempted from price control because of difficulties of establishing adequate controls.

Hail to Our Flag!

IN ACCORDANCE with a very general war-time practice of magazine publishers, the cover of this July issue of ROCK PRODUCTS is devoted to a reproduction of our National Emblem—this being the 167th anniversary of the birth of the Nation.

The numbers one, six and seven add up to 14 and one and four add up to five. Five is a figure which, according to numerologists, means action. Let's hope this year of 1943 and the 167th anniversary of the independence of the United States will be a year of the kind of action that will once again free us from all who would circumscribe our cherished freedom.

Since the cover of ROCK PRODUCTS is sold under yearly contract to a regular advertiser and that advertiser kindly consented to take a more modest place in the book we have him to thank for our use of this cover to display the Flag.

Sales Promotion

United States Gypsum Co., Chicago, Ill., with a lot of publicity, recently "rejuvenated" a 60-year-old house in one of the suburbs. A study was made of materials, methods, insulation, heating and ventilating, illumination, electrical and gas service, household utilities, fire protection, and fire insurance ratings.

A summary of facts developed as a result of this eight months' rebuilding job shows that there are 32 different remodeling jobs that can be done in an average seven-room house for less than $500 each.

These include adding a recreation or refuge room, building a fruit storage room, improving the laundry, modernizing the kitchen, adding a "three in one" room to take care of an extra war worker in addition to the family or to provide a study, and making an old fashioned living room attractive and cheerful.

Other suggested remodeling jobs are adding a front hall closet and modernizing the front entrance, doubling and tripling the capacity of closets and inefficient storage space; removing hazard of narrow steps, dangerously located swinging doors, low headroom, and unsafe wiring; adding details to bedrooms to make them more attractive for either youngsters or grownups, and building conveniences into bathrooms.

The house has been purchased by an official of the United States Gypsum Co., who is now occupying the remodeled structure.

YOU CAN BOOST YOUR PLANT CAPACITY 8% TO 20% NOW!

(1) Keep your thickener loaded to capacity and make provisions to keep it moving even when overloaded.

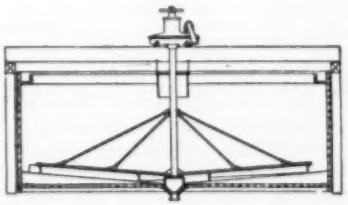
(2) Regulate your ball mill feed automatically to compensate for changes in feed size, moisture and hardness.

(3) Keep surges out of your classifier circuit by dividing your separation into individually controlled compartments.

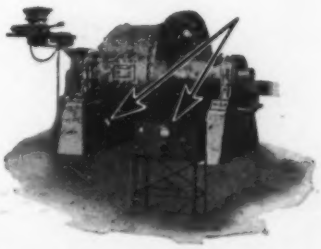
(4) Control your mill feed by weight rather than by volume.

(5) Permit your filter to run to best advantage regardless of moisture variation in the cake.

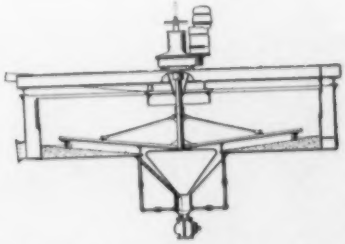
(6) Change the grinding characteristics within your mill.



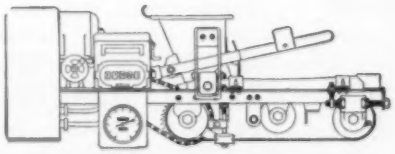
(1) Install the Hardinge "Auto-Raise" Mechanism on Thickeners so you can keep operating right through an overload. This device lifts the scraping mechanism over the obstruction and digs out of trouble. Bulletin 31-C.



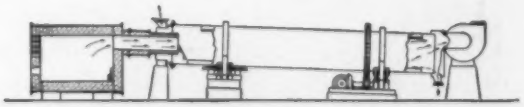
(2) Connect an "electric Ear" Sound Control to your mill feeder and keep mill up to its maximum grinding capacity with nominal attendance. Bulletin 42.



(3) Place a Hydro Classifier with controllable settling pool volume and teeter washing column in your classifier circuit and obtain a balanced separation and avoid surges caused by improper ratio of density to volume. Bulletin 31-C.



(4) Install a Hardinge Constant Weight Feeder ahead of your mill, and feed by weight to minimize fluctuations in rate and get a record of the actual weight fed. Bulletin 33-C.



(5) Use an "XH" Ruggles-Coles Dryer with automatic temperature control to increase flexibility of drying operations and permit wider latitude of moisture in the feed than is possible with any other system. Bulletin 16-C.

(6) Wet Grinding—Equip your Hardinge Conical Mill with a Reverse Cone Grate and High Pulp Level Discharge which will boost capacity 8% or more.

Dry Grinding—Use a "LOOP" air Classifier to increase mill grinding efficiency and capacity. Bulletin 13-D.

HARDINGE

COMPANY, INCORPORATED - YORK, PENNSYLVANIA

122 East 42nd Street, New York, N. Y.
205 West Wacker Drive, Chicago, Illinois
501 Howard Street, San Francisco, California
200 Bay Street, Toronto, Ontario, Canada

Chemist Corner

(Continued from page 68)

loss from kiln clinker to treated clinker it is noted that the treater has nearly the same efficiency as the kilns. The K_2O expulsion does not show quite as high an efficiency. However, when the temperature differential between kiln and treater is considered it might even be possible to reverse these efficiencies if the treater temperatures were increased to equal the kiln temperatures. These trial burns wre made with a normal degree of treatment.

The results of these eight plant trial burns were very gratifying to us in that it showed a practical and feasible method for reducing alkalies.

In order to show how close the eight plant trials compared with a continuous production record of 75,000 bbl., we have taken the alkali results from the cement bin acceptance tests (42 analyses), grouped them according to C_3S content and averaged alkali results for each group. These results are shown in Table IV.

In Chart VII we show graphically how the above results compare to the alkali results obtained on the eight plant trial burns.

TABLE IV—ALKALI RESULTS FROM BIN ACCEPTANCE TESTS

C_3S	K_2O	Na_2O	Total as Na_2O
30.2%	.348	.315	.544
33.1%	.366	.328	.563
36.5%	.311	.308	.516
38.6%	.306	.299	.500
40.8%	.276	.281	.461

The Na_2O results from the bin acceptance tests compared very favorably with the graph of Na_2O for the clinker treated trial burns, while the K_2O results were somewhat lower, .05 percent being the maximum difference between the cement and clinker results.

The present stage of development in producing low-alkali cement has seen a decided improvement in our operating technique of the treater which gives a greater expulsion of the alkalies over that shown in the eight plant kiln trial burns.

The greatest difficulty was found in the adapting of installed cooling equipment for a purpose diametrically opposite to that for which it was designed. The process proved so successful that we have only recently begun the production of 200,000 bbl. of A.S.T.M. Type IV cement, with an alkali limitation of .60 percent total as Na_2O for the U. S. Bureau of Reclamation.

The process as practiced here with the present equipment does not permit the installation of any of the current efficient clinker grate coolers. We must resort to the use of a water spray at the treater discharge to effect sufficient cooling.

Develop Weatherproofed Gypsum Siding Board

UNITED STATES GYPSUM CO., Chicago, Ill., is now manufacturing what is claimed to be the first fully weatherproofed gypsum siding board. It is a double-laminated board with an olive green outside surface that needs no paint and manila inside surface which may be left exposed. By the use of this board, it is said that a carpenter can complete all three operations usually required for the erection of a wall in so-called "duration" type buildings; namely, sheathing, placing of siding, and painting. Edges, ends, and surfaces are said to be impervious to water. It also has fire-proof properties.

Lease Gravel Plant

J. H. RIGDON has leased the sand and gravel plant at Barlow, Ore., from his brother, E. L. Rigdon. J. H. Rigdon has been manager of the plant for a number of years.

...on the INDUSTRIAL FRONT
WITH PLYMOUTH

THE man at the throttle today is Uncle Sam. He needs production! He wants maximum efficiency in handling the materials of War! That's where Plymouth enters! Plymouth Locomotives provide peak performance on all types of work, in all kinds of weather.

Ruggedly built . . . extremely efficient . . . low first cost . . . low operating cost . . . minimum maintenance . . . speed and versatility . . . Plymouth guarantees dependability on the drive to Victory! Plan your production with Plymouth Gasoline or Diesel powered locomotives. Available in accordance with the war production planning of our government.

TRACK HAULAGE is CHEAPER HAULAGE

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Division of The Fate-Root-Heath Co. PLYMOUTH, OHIO, U. S. A.

The LIMESTONE and CEMENT Equipment "MUST" of the Year

the Big Annual August Cement Issue

"Cement—What of the Future?"

...is the theme of this yearly, outstanding special issue of ROCK PRODUCTS.

Problems of the cement industry this year, both in regard to war production and post-war plans, are momentous and "tougher" than in many a year.

That is why it is so timely that in August ROCK PRODUCTS these problems will be outlined and possible solutions offered. New developments, improvements and new trends will be covered in detail, not only by the able staff of ROCK PRODUCTS editors, but by prominent authorities active within the industry.

Cement Readership Highlight of the Year

ROCK PRODUCTS leads in cement circulation and editorial leadership. This combination offers an unusual opportunity for advertisers in the industry.

August ROCK PRODUCTS will as usual be edited to interest all producers in the Rock Products industries.

Plan now to be adequately represented in this most important source of cement information—your big opportunity of the year. Schedule your space now for August ROCK PRODUCTS.

—FIRST FORMS CLOSE 20TH OF MONTH PRECEDING

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1ST *In Reader Preference in the Volume Aggregate Plants*

1ST *In Cement Circulation*

1ST *In Editorial Leadership*

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THE INDUSTRY'S RECOGNIZED AUTHORITY

TRADEPRESS PUBLISHING CORPORATION · 309 W. JACKSON BLVD., CHICAGO 6

INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below.

1 BELTS.—Audubon Wire Cloth Corp. Catalog No. 50 describes and illustrates woven wire belting for continuous weighing and processing. Operating and engineering hints for installing Metalwove belts, specifications for the spiral weave and balanced weave wire belts are given, also illustrations of the different types of weave.

2 BELTING.—Teuscher Pulley & Belting Co. has released a new catalog, No. 44, showing the net price and stock list of pulleys and belting, sheaves, sprockets, etc. One section contains rules for finding the diameter speeds of pulleys and shafts.

3 COMPRESSORS. — Davey Compressor Co. has issued a comprehensive 42-page Operator's Instruction Manual, Form E-144, covering the operation, care and maintenance of air compressors. One section includes a complete supplement on the operation and maintenance of pneumatic tools. The bulletin also contains sectional assemblies of the various models, and a schematic wiring diagram.

4 CONTROLS.—General Electric Co. has published a new 12-page bulletin (GES-1724D) describing and illustrating the magnetic and semi-magnetic types of full- and reduced-voltage synchronous-motor controls. Also listed and described are the several metal cabinet-type enclosures available for protecting these controls.

5 CONTROLLERS. — Wheelco Instruments Co. has issued Bulletin Z6200, which supersedes Z6100, describing and illustrating measuring and control instruments, featuring temperature controllers, pyrometer controllers, potentiometer controllers, portable potentiometers, etc. Scale ranges and construction features are also given.

6 DIESELS.—Caterpillar Tractor Co. has brought out a booklet entitled "Caterpillar Diesels go to War" which describes and illustrates both combat and non-combat use of diesels.

7 DRILLS. — Ingersoll-Rand Co. has brought out printed sheets to aid users of rock drills in recording repair and maintenance costs. These sheets, 8½- x 11-in., make it possible to show accurately the upkeep cost of every drill in service; also such data as drill number, class, model, manufacturer, names and numbers of new parts installed, cost of installing parts, number of shifts the drill works, etc.

8 DRIVES.—American Pulley Co. Catalog R-42 describes and illustrates reduction drives in sizes from ½ to 25-hp. and having a fixed speed ratio of 13 to 1. A feature of the unit is the ease with which it is installed on the shaft

9 FEEDERS.—Ross Screen & Feeder Co. Catalog X2 presents the whole range of equipment for crushing plants consisting of chain feeders, drop-bar feeders, and two-roll grizzlies. The catalog contains descriptions and illustrations of each type, also detail drawings.

10 FILTER CLOTHS.—William W. Stanley Co., Inc., has published a new bulletin F-68, describing cotton and wool filter cloths, ranging from 8 oz. to 50 oz. per sq. yd., in widths from 18-in. to 120-in.; also cotton ducks in weights from 5 oz. to 45 oz. per sq. yd. Included in the bulletin are various samples of filter cloths and a description of each.

11 GRAVEL PLANTS. — Diamond Iron Works, Inc., has released a 10-page two-color bulletin D-43-G, illustrating and describing portable rotor-lift gravel plants. The bulletin gives useful hints in selecting a portable gravel plant. Flow charts and complete table of sizes and specifications with adequate illustrations of all parts and features are given.

12 INSULATORS.—The B. F. Goodrich Co. has issued an engineering work sheet as a valuable addition to its catalog section on Vibro-Insulators for anyone interested in the problems of isolating vibration, shock or noise. The new work sheet is an aid in compiling data regarding location of equipment, motive power, frequency of vibration, etc., and when filled out gives all the information needed to recommend the proper type of Vibro-Insulator.

13 KILNS.—Vulcan Iron Works has released Bulletin A-375 describing and illustrating continuous rotary kilns, coolers and dryers, roasters, retorts, calciners, incinerators, etc. Crushing rolls, pulverizers and grinding mills, briquetting machines for coal, ore, fluedust, etc., shaking-chute conveyors, industrial locomotives are also described and illustrated in the bulletin.

14 MULTIMETER.—Superior Instruments Co. has released a 4-page bulletin describing and illustrating the junior multimeter (3¼- x 5- x 7-in.) which measures volts, ohms, currents, capacities, reactance and inductance, and the new Model 560 industrial analyzer (8½- x 7- x 4¼-in.) that provides all measuring services required for maintenance, development, testing and laboratory work; also the new Model 520 insulation and breakdown tester which automatically glows to indicate leakages up to 1000 megohms. Special features and specifications are also given.

15 OPTICAL EQUIPMENT. — Bausch & Lomb has published a new book entitled "Bausch & Lomb At War," which shows in sixty illustrations some of the scores of optical instruments being delivered to the armed forces—height finders, range finders, battery commander's telescopes, binoculars, searchlight mirrors, photographic lenses, mapping equipment, gun sights, aviator's goggles, etc. The book is a case history of one of the country's most important industries at war, the fourth war in which this 90-year old company has actively participated.

16 SPEED REDUCERS. — Winfield H. Smith, Inc., has published an interesting 24-page booklet describing and illustrating 42 years of progress in speed reducers. The booklet also gives the history of the company behind the product.

17 TRACTORS.—Caterpillar Tractor Co. has released an interesting booklet entitled "How 'Caterpillar' Helps Fight World War II," Form 7767, describing and illustrating the part "Caterpillar" men and machines are doing to help win this war. The booklet contains many action pictures of Diesel tractors at work, and gives considerable information on the safety methods, apprentice and emergency training of employes, U. S. Army school, etc.

18 TRANSMISSION.—Reeves Pulley Co. new catalog TR-432 contains descriptions, illustrations and composite dimension diagrams of both the horizontal and vertical designs of the reducer-type transmission. Engineering data and rating tables for the selection of a unit of the proper size are also given.

Cut Out and Mail This Coupon to

ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, Ill.

I would like to have the items circled. (7-43)

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11	12	13	14	15
16	17	18		

Name ..... Position .....

Company .....

Street .....

City & State .....

Sink-and-Float Process

THE SINK AND FLOAT CORPORATION, 9 Rockefeller Plaza, New York, N. Y., has issued a bulletin fully describing and illustrating the advantages of the process. A study of this literature by anyone having a sorting problem could prove helpful.

The sink-and-float process was introduced in 1928 in the coal industry as a means of separating shale from coal. Since then upwards of twenty or more plants have been built processing coal, and the success of the process there has led to its introduction into other fields. The lead-zinc producers have in many plants added it to their flow sheet with signal success. Recently, in the rock products field, the sink-and-float process has been introduced as a means of separating garnet from waste material. No doubt, as the simplicity and cheapness of the process becomes known to the non-metallic industries, other uses will be found for this more recent metallurgical tool.

The process makes separations of ore particles of different specific gravity by immersion of the crushed ore in the medium of a liquid whose specific gravity lies between the specific gravities of the heavy and light portions of the ore. In such a liquid the lighter particles float and the heavier sink, thereby effecting the separation.

The liquid used varies with different types of ores. Stable suspensions of barites and clay in water are favored in the coal processing. Others have found that finely ground galena, magnetite or ferrosilicon make excellent heavy density solutions.

The advantages of the process are low installation cost and low operating costs. The ores need only to be crushed to about 1-in. to make them amenable to the process and the tonnage handled is surprisingly large.

The process could find a considerable use in the processing of cinders so as to remove coke. This is highly desirable to many cinder block manufacturers. Others might find it applicable to the removal of deleterious material from sand and gravel, especially where such materials are of different specific gravities of the main bulk of the aggregates. The differences in specific gravity need only be 0.01, it is claimed, to make the process practical.

Grant Gravel Permit

JOSEPH MARIANI has been given a permit by the Board of Zoning Appeals of New Haven, Conn., to conduct a sand and gravel business on his property on Skill street.

Segmental Design + Heat Resistant Alloy = *Less Maintenance and More Product*

Most of the users of Amsco Alloy segmental rings for kiln feed and discharge ends are cement producers, but some of them are makers of lime and heavy chemicals. Without any exception we know of, all of them agree that the combination of heat-resistant chromium-nickel alloy with a good segmental design is unequalled for effecting continuous kiln operation and low maintenance cost. Repeat orders are one evidence of this fact.

The temperatures to which kiln rings are subjected are so high that ordinary metals soon show permanent "growth" or belling out; and the distortion allows the brick to fall out—this defect quite aside from the cracking and scaling that curtail the casting life.

None of these difficulties is experienced with Amsco Alloy rings. The segments have room to expand and contract without warping, and the heat-resistant metal does the rest.

Their use means fewer shutdowns for repairs, which in turn mean fewer man-hours and fewer parts for maintenance; and a real gain in production volume over a given period of time.

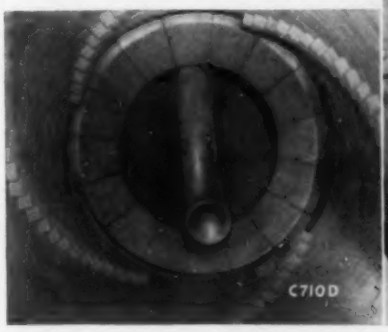
The one of the several analyses of Amsco Alloy, grade F-10, that is most commonly used for feed end and nose rings, has excellent strength and creep resistance up to 2100° F.; and comparatively good residual ductility when cold.

Among the many applications for this metal in cement plants and comparable operations are also dampers, feed pipes, hopper extensions, lifter bars, clinker drag chains, grates and burner nozzles. Our experience, research and production facilities are at your service.

Bulletin 108, sent on request, tells the whole story.

C-710-D—A 16-segment conical feed end ring.

C-709-B—Amsco Alloy segmental nose or discharge ring.



Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

AMERICAN Brake Shoe COMPANY

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

FINANCIAL NOTES

RECENT DIVIDENDS

Arundel Corp.	$0.25	July 1
Calaveras Cement Co. 7% pfd. (p100) (arrears)	.75	June 15
Canada Cement Co., Ltd., 6½% pfd. (p100) (arrears)	1.25	June 21
Consolidated Cement Corp. Cl. A	.35	June 19
Ideal Cement Co. Q	.35	June 30
Industrial Silica Corp. 6½% pfd. (p100) (ar'rs)	1.62½	June 10
Kelley Island Lime & Transport Co.	.20	June 30
Lehigh Portland Cement Co. Q	.37½	Aug. 2
Lone Star Cement Corp.	.75	June 30
Missouri Portland Cement Co. Com. (p25)	.25	June 30
Pacific Coast Aggregates, Inc.	.03	June 19
Pennsylvania Glass Sand Corp.	.25	July 1
Pennsylvania Glass Sand Corp. pfd.	1.25	July 1
Southern Phosphate Corp.	.10	June 30
Superior Portland Cement, Inc. Cl. A pt.	.62½	July 1
U. S. Graphite Co. Com. (p5)	.20	June 15
Yosemite Portland Cement Co. pfd.	.10	July 1

•

MATERIAL SERVICE CORPORATION, Chicago, had a consolidated net income for 1942 of $593,927 as compared with $671,258 for 1941. The lower net income contrasted with a rise in net sales to $16,062,889 in 1942 from $13,090,406 in 1941, and was explained by the increase in the cost of sales, general selling expenses, and a rise in federal income and excess profits taxes to $649,600 in 1942 from $359,700 in 1941. Net sales in 1942 were the highest in the company's history, according to Irving Crown, vice-president.

•

PENNSYLVANIA GLASS SAND CO., Lewistown, Penn., showed a net profit of $150,482 after charges and a provision of $290,015 for federal income and excess profits taxes for the first quarter of 1943. This compares with a net profit of $146,100 for the quarter ended March 31, 1942, when provision for federal taxes was $269,951.

•

ALPHA PORTLAND CEMENT CO., Easton, Penn., stockholders voted June 30 on a proposal to reduce capital from $16,759,600 to $15,375,256, by retirement of 53,244 no par common shares now held by the company.

•

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., showed a net profit of $1,718,879 for the 12 months ended March 31, 1943, after taxes and charges, as compared with $2,354,979 for a like period in 1942. Taxes for the year ended March 31, 1943, were $4,332,630 as against $2,362,977 for the same period ended March 31, 1942.

•

FLORIDA PORTLAND CEMENT CO., Tampa, Fla., presented the following income account for the years ended December 31:

	1942	1941
Net sales	$3,393,081	$4,573,369
Cost of sales	2,439,225	3,142,099
Selling, etc., exp.	335,318	357,200
Operating profit	618,538	1,074,069
Other income, net	959	2,762
Total income	619,497	1,076,832
Fed income taxes	223,000	238,668
Excess prof. tax	77,000	263,000
Post-war tax cred.	cr7,700	.....
*Net income	327,197	575,164
Preferred divs.	174,899	524,696
Surplus for year	152,298	50,468
Earn. surp., 1-1	355,307	304,839
Surplus, 12-31	507,605	355,307
Earned pfd. share	$6.55	$11.51
†Earn., com. share	d 0.30	3.01
No. of pfd. shares	49,971	49,971
No. of com. shares	74,986	74,986

*After depreciation and depletion: 1942, $175,702; 1941, $171,800.
†Disregarding preferred arrears.

For the first three months in 1943, the Florida Portland Cement Co. had a net profit of $130,937 as compared with $210,911 for a like period in 1942.

•

CONSOLIDATED CEMENT CORPORATION, Chicago, Ill., had a net profit of $45,753 for the first quarter of 1943. This compares with $24,446 for a like period in 1942.

•

ALPHA PORTLAND CEMENT CO., Easton, Penn., reported a net income of $1,089,646 for the 12 months ended March 31, 1943, as compared with $1,393,808 for the year ended March 31, 1942. Net sales for the year ended March 31, 1943, were $10,716,284 as against $10,453,003 for a like period ended March 31, 1942.

•

BASIC REFRACTORIES, INC., Cleveland, Ohio, has reported net sales of $5,236,011 for the year ended December 31, 1942. This compares with $4,493,126 for the year 1941.

•

THE WARNER CO., Philadelphia, Penn., including its subsidiary, American Lime & Stone Co., reported total sales for the year ending December 31, 1942, were $10,313,935 as against $9,676,570 for a similar period in 1941. Net income in 1942, after income taxes, depreciation and depletion, was $883,701 as compared with $1,179,921 in 1941.

•

NEW ENGLAND LIME CO., Adams, Mass., presented the following income account for the years ended December 31:

	1942	1941
Net sales	$426,289	$583,592
Cost of sales	378,893	454,511
Operating expenses	92,101	99,701
Depr., depl., etc.	35,981	32,087
Operating loss	80,686	2,708
Other income	132,210	82,195
Total income	51,524	79,487
*Interest	16,143	48,429
Other deductions	.....	3,837
Fed. income taxes	9,000	8,700
Net income	26,381	18,521
†Times int. earn.	3.19	1.56
Earn., pfd. share	$34.08	$23.93
No. of pfd. shares	774	774

*At rate of 3% (1941, 9%).
†Before Federal income taxes.

Construction of the magnesium plant in Connecticut is about completed. This plant will be operated by the company for the Defense Plant Corporation.

•

SIGNAL MOUNTAIN PORTLAND CEMENT CO., Chicago, Ill., has submitted the following income account for the years ended December 31:

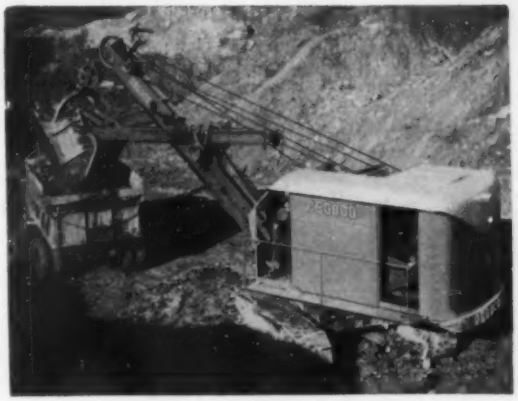
	1942	1941
Net sales	$2,686,207	$2,390,843
†Cost of sales	1,988,656	1,763,063
Selling, etc., exp.	261,159	254,633
Operating profit	436,392	373,147
Other income, net	4,831	dr 6,234
Total income	441,224	366,913
Fed. income tax	170,156	109,734
Excess prof. tax	17,000	.....
Post-war tax cred.	cr1,700	.....
*Net profit	255,768	257,179
Preferred divs.	113,395	151,313
Surplus for year	142,373	105,866
Earn. surplus, 1-1	391,080	249,291
Deprec. adjust.	.....	cr35,922
Earn. surpl., 12-31	533,454	391,080
Earn., pfd. share	$13.53	$13.61
‡Earn., com. sh.	3.49	3.53
No. of pfd. shares	18,899	18,899
No. of com. shares	29,983	29,983

*After deprec.: 1942, $69,324; 1941, $61,490.
†Includes freight on shipments: 1942, $775,831; 1941, $656,311.
‡Disregarding preferred arrears.

•

AMERICAN LIME & STONE CO., announced on June 15 that its parent, Warner Co., had guaranteed payment of all sums payable by company with respect to principal and interest of 1st s.f. 5½s due March 1, 1951, including sinking fund payments, as and when due at maturity or by acceleration or otherwise. The guarantee was given as part consideration for a lease of the operating plant and property of American Lime to the Warner Co., for a period of ten years.

OSGOOD



AIR CONTROL

leads them ALL in smooth, fast and efficient shovel, dragline or crane operation.

THE OSGOOD COMPANY
MARION, OHIO, U. S. A.

FASTEST POURING

Almost Any Job of Concrete Can be Done Faster with JAEGER TRUCK MIXERS

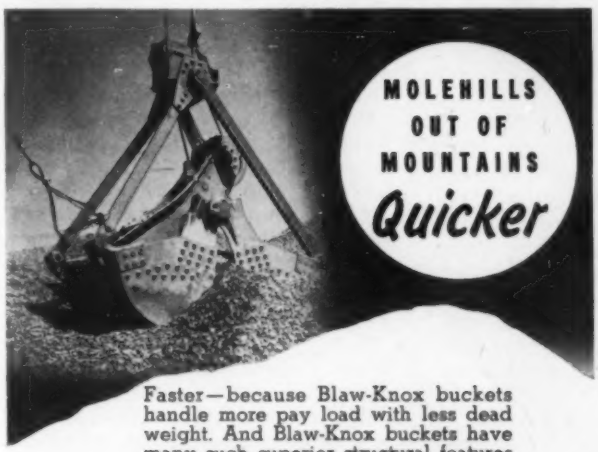
"HIGH DUMP"

Millions of yards of Jaeger Truck-Mixed Concrete on major war work (exceeding the output of all other makes combined) prove the advantages of these motorized concrete plants. Nimble, flexible and fast, they speed placement, solve problem of extended or continuous pours.

or "LOW CHARGE" TYPE

THE JAEGER MACHINE CO.,
603 Dublin Avenue
Columbus, Ohio

Mixers—Pumps—Hoists
Paving Equipment



MOLEHILLS OUT OF MOUNTAINS *Quicker*

Faster—because Blaw-Knox buckets handle more pay load with less dead weight. And Blaw-Knox buckets have many such superior structural features as the rigid head to maintain cable alignment, prevent wear—and sealed ball-bearing sheaves in the lever arm to improve operating efficiency.

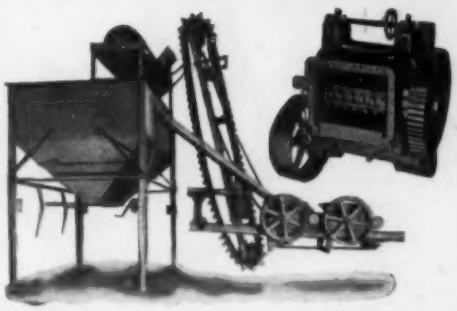
Write for catalog . . . Or send us your specifications and we'll be glad to show you how Blaw-Knox buckets can meet your needs—economically!

BLAW-KNOX BUCKETS

BLAW-KNOX DIVISION of Blaw-Knox Company
Farmers Bank Building, Pittsburgh, Pa.

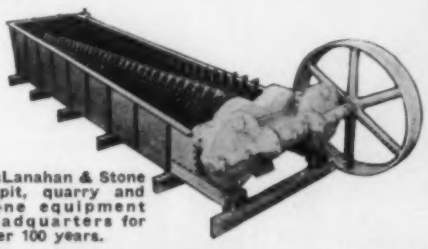
McLANAHAN

SCREENS • CRUSHERS



COMPLETE PLANTS

McLanahan equipment will prepare your plant for more business. Single and double roll and jaw crushers, hammermills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, and hoists—complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any materials.



McLanahan & Stone—pit, quarry and mine equipment headquarters for over 100 years.

McLanahan & Stone Corp. *Established 1835* HOLLIDAYSBURG PENNSYLVANIA

Industrial Sand Meeting

(Continued from page 55)

ject for discussion was possible research work. There was little enthusiasm for starting any association research at this time, although all members appeared to agree as to its ultimate necessity.

HAMILTON ALLPORT, as chairman of the research committee, made an interesting and comprehensive report, much of it a reiteration of last year's report of the same committee. With some revisions this will soon be made available to members.

STANTON WALKER, consulting engineer of the Association, reported on his activities as a member of the research committee of the American Foundrymen's Association. He said he had found the A. F. A. very coöperative and that its committees were engaged in many projects which vitally affect the industrial sand industry.

SCREW WASHERS
•
PADDLE TYPE LOG WASHERS
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SAND TANKS
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CLASSIFIERS
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SAND DEWATERERS
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GRAVEL CRUSHERS
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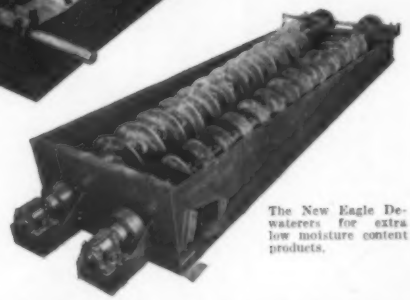
SWINTEK SCREEN NOZZLE LADDERS

The New Eagle High Efficiency Paddle Washers for operators with moderate capacities.



The New Eagle Dewaterers for extra low moisture content products.

As a result of our pioneering efforts and wide experience in the field, there is an Eagle unit for every washing, dewatering or classifying problem you may encounter. Eagle engineers have sponsored and guided the major developments in these fields. Write or wire us.

EAGLE IRON WORKS
Des Moines, Iowa

Safety Code—Insurance Rates

In the absence of THEODORE C. WATERS, attorney, Baltimore, Md., Secretary Ahearn read a comprehensive report on occupational disease compensation rates, quoting from data compiled by the National Council on Compensation Insurance, New York City.

A study of rates based on five years' experience shows that in nearly every instance the silica sand industry is paying higher rates than justified. Quoting from Mr. Waters' report:

"The method of determining rates differs in the various states, which may be generally classified in four groups, as follows:

"(*a*) *States having independent bureaus which determine the rates applicable to given classifications.* This group includes the states of New York, New Jersey, Massachusetts, Minnesota, Wisconsin, Virginia and California. In these states the insurance carriers must charge the rates determined by the State Bureau. Practically speaking, the rates established by the Bureau are those recommended by the National Council.

"(*b*) *States having no authority for the regulation of rates.* These include Illinois, Iowa, Nebraska, South Dakota, Connecticut, Rhode Island and New Mexico. In these states the individual insurance carriers may bargain with their insured and establish any rate that may be mutually agreed upon. As a matter of practice, however, the proposed rates and particularly the occupational disease charge are those recommended by the National Council on Compensation Insurance.

"(*c*) *Ohio, West Virginia and Washington have exclusive state funds, which determine their own rates.*

"(*d*) *Those states where the National Council recommends to the state departments a proposed schedule of rates, which is approved by and adopted by state departments.* This includes all of the remaining states of the United States, other than those listed under groups (*a*), (*b*), and (*c*) above. In these states the rates imposed are uniform, as recommended by the National Council.

After analyzing how the rates are arrived at under various codes Mr. Waters concluded:

"The present method for the determination of occupational disease compensation rates, with particular reference to silicosis coverage, is arbitrary and one not justified by the actual experience of insurance car-

riers in those states where occupational diseases are compensable under the statute. The only attempted justification for the rates is the official opinion of the carrier that in the event of a business depression they may be faced with a substantial number of claims for which compensation might be allowed.

"The carriers have been and still are prejudiced in their consideration of silicosis compensation. However, the officials of the National Council whom I have interviewed have indicated that they would be glad to entertain an interview with the officials of your Association and to consider a specific request for reduction in rates in those classifications in which our members would be interested.

"To that end, I believe it would be desirable for the Association to request an interview with the proper officials of the National Council, and to register our protest against existing rates, in view of the experience of our member companies in the states in which they are operating. It is my opinion that this would be particularly appropriate and timely in the event that the State of New York abolishes preferential rates and combines workmen's compensation and occupational disease coverage under one standard workmen's compensation rate."

Washington Highlights

V. P. AHEARN brought the convention to a conclusion with some very interesting extemporaneous remarks about present-day Washington and how government business is being done.

Registration

The following producers were present:

Ayers Mineral Co., Zanesville, Ohio; J. A. Crew, Russell G. Hay.

George W. Bryant Core Sand, McConnellsville, N. Y.; Mrs. C. F. Bryant Hartmann.

Browntown Silica Co., Browntown, Wis.; P. W. Palmer.

Deckers Creek Sand Co., Morgantown, W. Va.; Junius M. Strouss.

Great Lakes Foundry Sand Co., Detroit, Mich.; J. D. Cronenweth, W. Muhlitner.

Houghland & Hardy, Evansville, Ind.; C. M. Hardy.

Industrial Silica Co., Youngstown, Ohio; P. G. Foreman, L. M. Hansen.

Keener Sand & Clay Co., Columbus, Ohio; E. M. Durstine, C. P. Helmick.

Manley Sand Co., Rockton, Ill.; Dwight E. Manley, Lyle T. Manley.

Michigan Silica Co., Rockwood, Mich.; E. J. Beyer.

Minnesota Mining & Manufacturing Co., Akron, Ohio; J. S. Cable.

National Silica Co., Oregon, Ill.; John F. Putnam.

New Jersey Pulverizing Co., New York City; A. B. Schlesinger, Harry F. Spier.

New Jersey Silica Co., Millville, N. J.; C. R. Wolf.

Oneida Lake Sand Mines, Cleveland, Ohio; Jack Cleary.

Ottawa Hydraulic Silica Co., Ottawa, Ill.; N. H. Harlow.

Ottawa Silica Co., Ottawa, Ill.; E. O. Schneider, George A. Thornton, Henry C. Thornton.

Pennsylvania Glass Sand Co., Lewistown, Penn.; E. T. Andrews, T. C. Matthews.

George F. Pettinos, Inc., Philadelphia, Penn.; Louis Dill, Geo. F. Pettinos, Jr.

Sand Products Corp., Cleveland, Ohio; A. N. Farmer, Sterling N. Farmer.

South Jersey Sand Co., Philadelphia, Penn., E. W. Finkbiner.

Standard Silica Corp., Chicago, Ill.; Hamilton Allport, William C. Cook, J. M. Kittleman, C. R. Marthens.

Wedron Silica Co., Chicago, Ill.; A. Warsaw.

Whitehead Brothers Co., New York City; A. Y. Gregory.

Lime Forum

(Continued from page 58)

The rotary kiln at this plant taught Mr. Mau and myself a great deal. Superficially examined one would say that nothing was wrong, but after a bit more prolonged study it was the opposite conclusion we arrived at. It was a nice looking installation although a very short rotary, only 6- x 80-ft., with a 4- x 30-ft. rotary cooler, but oil consumption was very high and the lime was very poor.

As the kiln did not have a dam at the outlet, it carried a very light load. Due to this the larger stone rolled through the kiln quickly and contained all of the core while the small lime was overburned.

Then it was found that the cooler had a stack through which the hot air passed to waste instead of entering kiln. These coolers are not much good anyway, but this one for some strange whim of the plant designer was not even given an opportunity to serve in the limited manner it could.

The oil flame in the kiln was concentrated and very hot; just about 2800 deg. F., and probably a little more at the tip. I did not know it then but there was something radically wrong right in front of me, but I was completely blind to it. Soon thereafter Mr. Mau started his gas sampling and he found temperature of discharging gases at 1130 deg. F., CO_2—10.8, O—11.5, CO—0. The high oxygen indicates very high excess air which, considering the location of the sampling pipe, must have been coming through the kiln.

Next we attempted to burn out the oxygen by increasing the amount of oil. The result was CO_2—10.0 percent,

Made of Acid Open Hearth Steel Wire

Round Strand
Flattened Strand
Preformed
Steel Clad
Non-Rotating

The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
Established 1857
5909 Kennerly Avenue St. Louis, Mo.
New York — Chicago — Denver
San Francisco — Portland — Seattle

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service

EARLE C. BACON, Inc.
17 John St., New York, N. Y.

O—11.4 percent, CO—.6 percent and smoke. There was practically no change in the oxygen content even though there was now a state of incomplete combustion, so we were plenty puzzled, but not for long.

We looked at the flame again. It was narrow, filling out but little of the kiln space, probably half, and beyond the flame in the other half of the cross-section the air was sneaking by.

Naturally the air stream down the kiln fills out the entire cross-section, but an oil burner, differing from a powdered coal burner, will ordinarily give a narrow flame and so utilize only a part of the air passing through the kiln. I am sure that this is something more or less common to all rotary kilns fired with oil.

On return to the office we worked up the heat balance, which was as follows:

	Percent
Heat loss due to dry products of combustion	20
Heat loss due to excess air	21
Heat loss due to incomplete combustion	1
Heat loss in escaping CO_2 from stone	4
Heat loss due to vapor from combustion of hydrogen	7
Heat loss due to non-recovery of heat from lime	12
Radiation loss	15
Kiln thermal efficiency	20
	100

One seldom finds a greater opportunity for improvement; merely reducing excess air loss and heat in lime loss would increase efficiency tremendously. A dam in the kiln end would improve the product. Capacity would increase and fuel ratio improve greatly.

My visit was at an end and my bid for Clipper transportation back to the Mainland was in. After that one just waits, and some wait for weeks. One never receives more than a couple hours' notice. I received mine late the next Sunday morning, and was told to be in Pearl Harbor at a certain time that afternoon. There was little time left, one more swim off Waikiki Beach, then good-bye to my friend (I hope) Bingham; next morning by Philippine Clipper I was in San Francisco.

Certificate for Lime Spreader Not Necessary

War Production Board has changed its ruling so that it is no longer necessary to obtain a certificate from the A.A.A. for the purchase of an agricultural limestone or lime spreader. The limestone spreader equipment will be classified as a truck body. However, on limitation order L-70, it is still necessary for the purchaser to furnish a certificate or permit.

Graphite Concern Expands

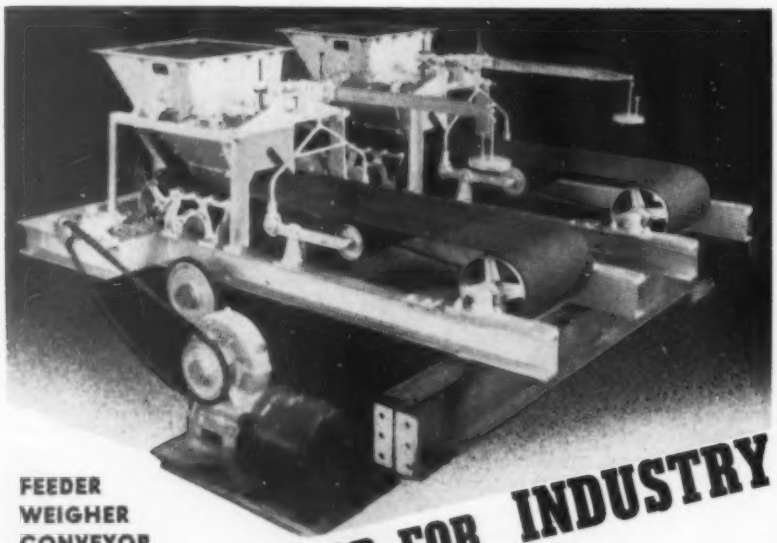
Benjamin Franklin Graphite Co., West Chester, Penn., has been given authority by the Defense Plant Corporation for funds to provide additional equipment for a plant in Pennsylvania, amounting to about $425,000.

Buys Out Partner

H. L. Morris recently purchased the interests of Mr. Moss, his partner, and is now the sole owner of the Commercial Lime Co., El Dorado Springs, Mo. This company has been active in the production of agricultural limestone.

Purchase Quarry

Daanen and Janssen, De Pere, Wis., have purchased the Greenleaf stone quarry from the Western Lime and Cement Co., Milwaukee, Wis. The De Pere company plans to operate the quarry this season.



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● ● ● make *Schaffer Poidometers* an important factor in the pressure of today's wartime production.

Whatever the proportioning job—regardless of material, weight, or speed required—there's a *Schaffer Poidometer* to do the job exactly, uniformly, dependably.

If you have a proportioning problem—raw or finished materials—write for Catalog No. 2.

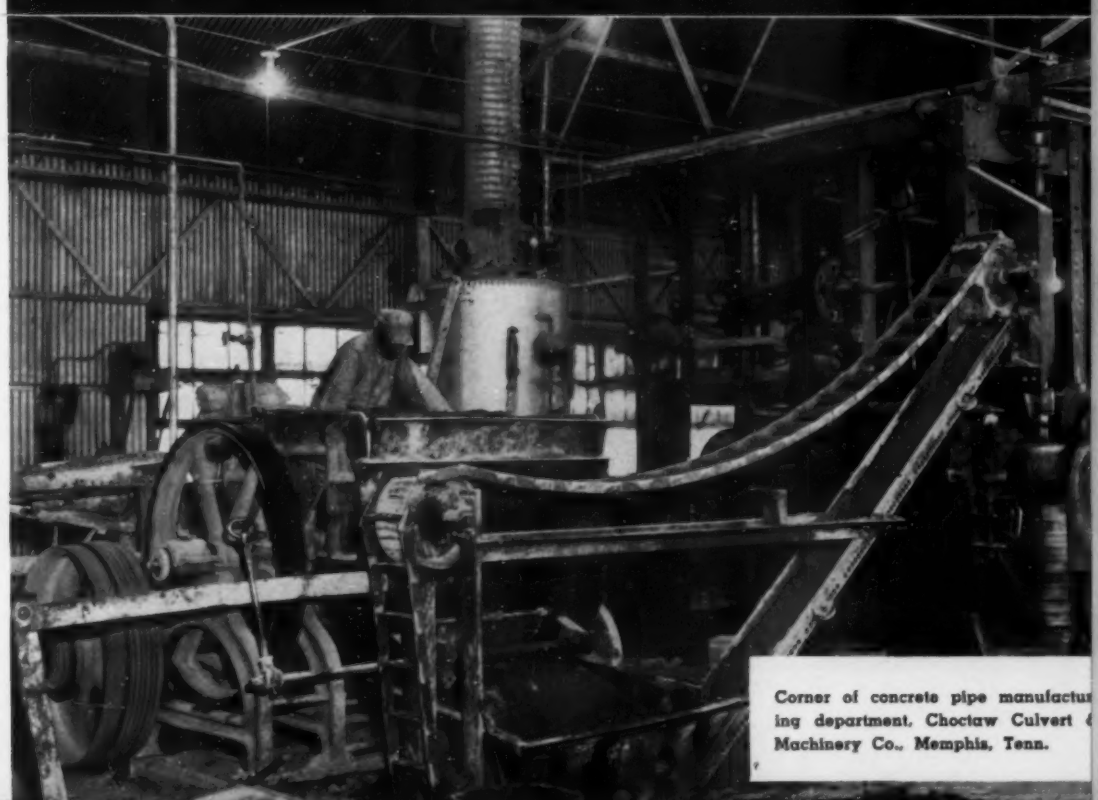
SCHAFFER POIDOMETER CO.

2828 Smallman St. Pittsburgh, Pa.

CONCRETE PRODUCTS AND CEMENT PRODUCTS

PIPE GOES TO WAR

Airport and war plant drainage, sewerage and water systems create heavy demand for concrete pipe



Corner of concrete pipe manufactur ing department, Choctaw Culvert & Machinery Co., Memphis, Tenn.

CONCRETE PIPE

All Sizes Up to 9 Ft. Diameter

Choctaw Culvert and Machinery Co., Memphis, Tenn., manufactures concrete pipe in three plants and in addition building block

By WALTER B. LENHART

ONE OF THE LARGEST, if not the largest, manufacturer of concrete pipe in Memphis, Tenn., is the Choctaw Culvert and Machinery Co. This plant was described in ROCK PRODUCTS soon after it was built. It was a very modest operation at that time but by continuing a sound sales policy backed up with the best merchandise that could be manufactured the company has grown and expanded its line of pipe and tile to include concrete block, lintels, I-beams and a miscellaneous assortment of decorative concrete objects. Besides the plant in Memphis, located at 1184 Tupelo street, there are plants at Columbus and Greenwood, Miss., and a plant at Little Rock, Ark.

Concrete block are manufactured in plants at Little Rock, Memphis, and Greenwood, but not at Columbus. Kirkham vibrator machines are operated at Little Rock and Greenwood. The Memphis plant uses a Besser tamper machine.

Tamper type block machine operated in the Memphis plant

The company also is the local representative for Allis-Chalmers tractors, Northwest shovels, Jaeger mixers and also construction machinery of other manufacturers. Alongside the plant is a large and modern machine shop and repair facilities for overhauling this type of equipment. A large volume of overhauling is done at this shop which serves the area around Memphis.

The plant at Memphis has grown from year to year with newer machines or more machines being added until the plant and yard now covers an area of 17 acres, all of which space is in use for making and storing about every size and type of block and pipe one could wish. Even during the Spring of last year, a No. 3 Sherman machine was added that makes all sizes of pipe up to 36-in. diameter and in 3- or 4-ft. lengths. There is also a McCracken roller head, type T, machine for up to 36-in. pipe and 4-ft. lengths, a McCracken Model S for pipe up to 24-in. diameter and 3-ft. lengths, and an R. & L. joist machine. Just recently the company installed a 60-in. Universal pipe machine. Besser equipment is used for making block.

The two McCracken pipe machines and the Besser machine are in one building and arranged in a straight line. The pipe machines use 2-cu. yd. mixers, three Besser and one Blystone, with the concrete delivered to the pipe machine by a steep, inclined belt conveyor provided with cleats on account of the steep grade of the conveyor. The Besser block machine uses an inclined skip. Cement in bags is used.

Sand and gravel, delivered to the

Concrete Masonry Units
The Universal Post War Building Material

Buy Victory Bonds to help win the war—and to build post war homes

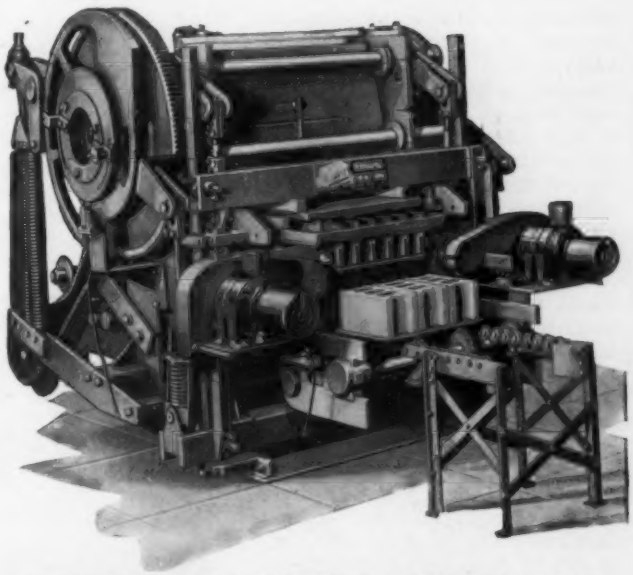
Modernized Concrete Masonry

The new concrete masonry units now being made are as modern, attractive and more practical than anything the dream designers have yet proposed for postwar miracle homes.

Besser Vibrapac block are adapted to any architectural style—no stock house designs or patterns. Their permanent newness insures lasting beauty and satisfaction. A sound investment in a substantial home has an appeal far greater than any fantastic design or material. Home builders of the future will want these four basic freedoms:

Freedom from high upkeep cost
Freedom from depreciation of value
Freedom from fire hazard
Freedom from discomforts of poor cold, heat and moisture insulation

Besser Vibrapac block insure these four freedoms.



Besser Super Automatic Plain Pallet Vibrapac with Mixer and Skip Loader. Capacity 600 8"x8"x16" per hour made 3 at a time on one plain pallet. Smaller units made in large multiples on the same pallets.

Important Patent Notice

Licensed under the Gelbman basic vibration patents.

Undirectional vibration licensed under Flinn patents.

The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

BESSER MANUFACTURING CO.

207 Forty-Third St. • Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

Roller head type pipe machine which also makes up to 36-in. pipe

plant by both rail and trucks, is ground stored. It is wheeled into the plant as needed in wheelbarrows. Superock is also delivered to the plant in cars. This is a lightweight aggregate prepared from slag at the steel furnaces in Birmingham, Ala. It finds a ready market in Memphis and about 50 percent of the block sales of this company are those products made from this popular lightweight aggregate.

Block made from Superock can compete in price with sand and gravel block even though the material has a freight haul disadvantage and a slightly higher unit cost, because an 8- x 8- x 12-in. unit of sand and gravel will weigh 35 lb. and a Superock block of the same size will weigh only 24 lb., so one ton of Superock will make more block than a ton of gravel. Again the freight (or trucking) cost on 1000 sand and gravel block would mean a 35,000 lb. haul as contrasted with 24,000 lb. for Superock. A net saving of 11,000 lb. or 5½ tons.

All the products are steam vapor cured for 24 hours at atmospheric pressure in ten curing rooms. They have five rooms 20- x 100-ft. for pipe; two rooms 10- x 100-ft. for block; and three rooms 25- x 100-ft. for pipe.

Pipe Specials Made in Separate Plant

The company also has a separate plant for making "Y's" "+'s," "T"s" (Y's, crosses, tees) for plumbing or drainage connections. Large diameter pipe is the most recent addition to its large line of concrete production. Late in March of this year an order for over a thousand lineal feet of 108-in. diameter concrete pipe was secured.

The company has eight steel forms for casting these huge units, each unit weighing 16,500 lb. after curing for two weeks. They are cast on end with 9-in. walls and in 5-ft. lengths. Concrete is mixed in a mixer mounted on a platform of the same height as the top of the forms. The material is delivered to each form in wheelbarrows. The concrete is tamped with a portable, gasoline-driven Masters vibrator that has a 1½-in. head. The welding machine for reinforcing is a Shearman type.

After 24 hours the forms are removed and following an additional 24 hours the fresh concrete pipe can be placed on edge. A strut is then placed inside until the concrete is two weeks old. This is just a safety precaution. With the eight forms the plant can turn out 40 lineal feet of pipe per day with a crew of about eight men. The forms are assembled and reinforcing cages installed by means of a No. 35 Universal crane.

After the pipe are a few days old they are rolled to the storage yard by an Allis-Chalmers tractor provided with a novel bumper as illustrated in Hints and Helps.. The machine also loads these heavy tile on low-slung semi-trailers for delivery. Two pipe are usually hauled at one load.

One of the attractive features of this well arranged and neat plant is the plant office. It is built to resemble a large diameter tile and has a novel fence around the lawn made up of sections of small diameter pipe over which grows a profusion of climbing roses. The trucking force finds the concrete lawn bench very

(Continued on page 94)

Tamper type pipe machine which makes sizes up to 36-in. diameter

STEARNS

First they won the Army-Navy "E" Award—first in the concrete products machinery field to be thus honored. Then the Stearns organization won the Treasury Bullseye flag—90% of Stearns men and women buying War Bonds to the extent of 10% of the total payroll.

Stearns plants are going strong. In addition to turning out war material, they are making—for necessary construction projects—vibration and tamp type block and brick machines, mixers and skip loaders. Write for circulars.

Stearns Joltcrete No. 9 makes nine 8x8x16-in. units per minute. Handles all types of aggregates. Other models of lesser capacity available.

Stearns Manufacturing Co.

Adrian, Michigan

Licensed under the basic Gelbman vibration patents.

PRECAST CONCRETE COAL BOXES

ARNOLD STONE CO. of North Carolina, Inc., Greensboro, N. C., manufacturer of cast stone and other concrete products, is making quite a business out of selling precast concrete coal boxes.

These coal boxes were developed originally in Knoxville, Tenn., by J. W. Warren of the Southern Cast Stone Co. for two large-scale housing projects in Tennessee. They are attractive precast concrete bins of ½-ton capacity designed for the storage of cooking coal, for installation outside houses which are financed by the U. S. Government.

They are made as single units, or double, of separate precast slabs which bolt together. The slabs are mostly 2½-in. thick, of vibrated concrete. Bolts and hinges for the top are provided for in the molds and the boxes may be locked. The Arnold plant is making the boxes to five or six different designs.

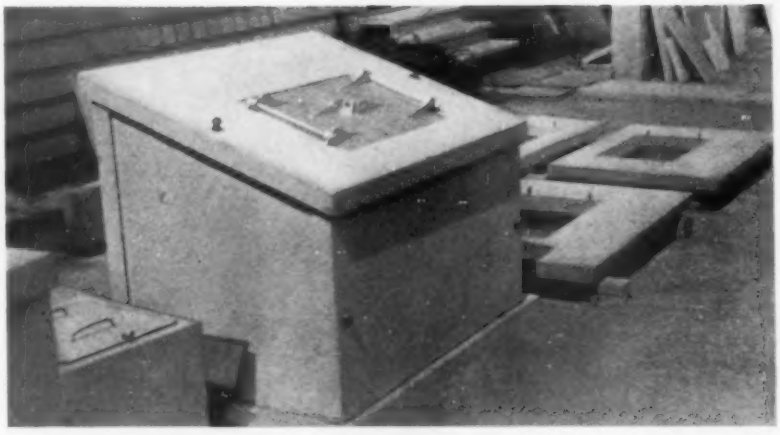
Use Sand and Crushed Granite Chips for Aggregate

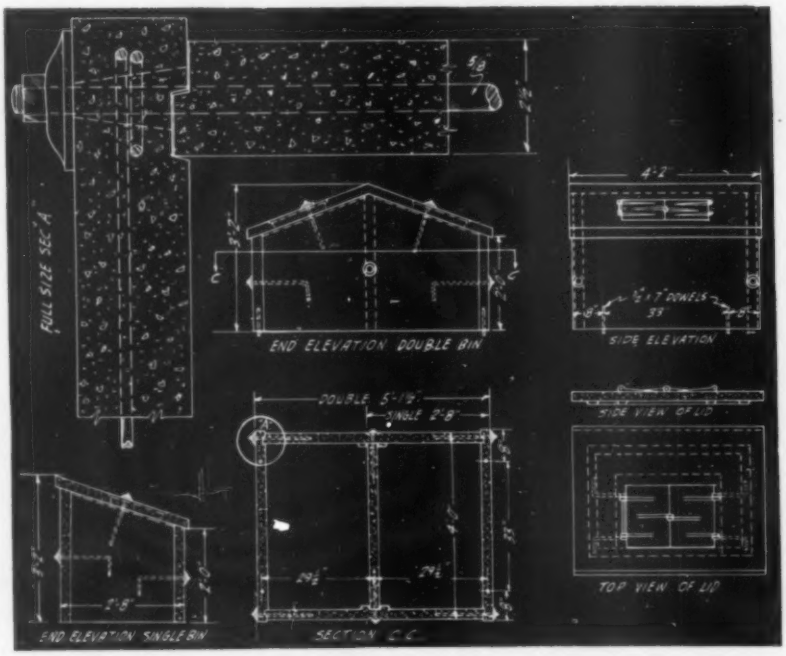
A 5-gal. mix of 1:4 concrete is used for the slabs, which is a little richer mix than usual for standard concrete products. Aggregates consist of natural sand and crushed granite chips. The mold boxes are set on tables in the plant, and are filled with concrete that is placed by hand-operated electric vibrators. The vibrators are equipped with bearing plates that are pressed on to the top surface of the wet concrete. Ten complete coal boxes are cast per day.

Concrete coal boxes were considered preferable to others because they require no maintenance and are easy to erect.

Arnold Stone Co. shipped 2100 boxes to low-cost housing projects, one of which is a defense project. These have been trucked, 12 boxes to a load, as far as Wilmington, N. C., which is 200 miles distant. Aside from the large scale jobs served, the product has good possibilities for sale to private home builders and home owners.

The company is also manufacturing precast concrete manhole fittings according to the Cast Stone Institute standard, and reflector-type traffic markers. Other specialties are in the development stage.





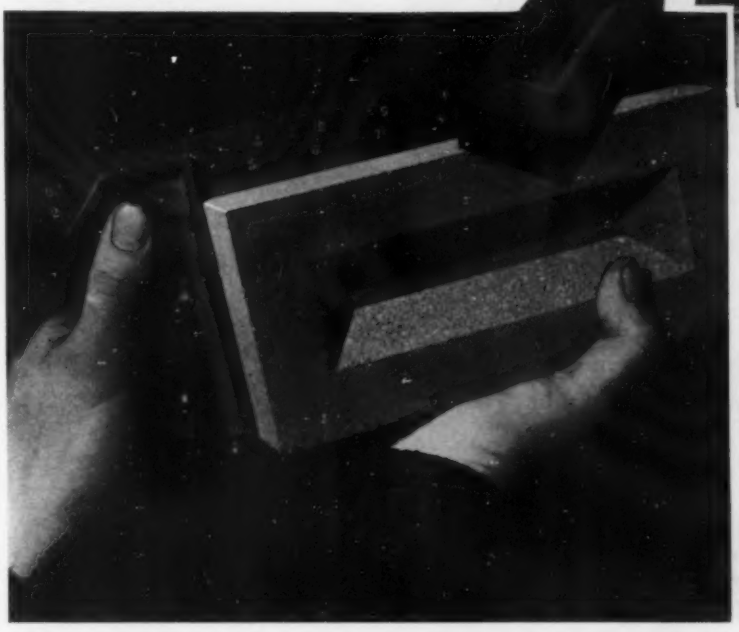
Right, above: Vibrating the concrete into place with an electric vibrator which is attached to a bearing plate. Center: A finished coal box made up of precast concrete slabs, on display at the plant. Below: Construction details of coal boxes made of bolted precast concrete sections

28,000 BRICKS IN ONE EIGHT HOUR SHIFT WITH THE J&C BRICK MACHINE

Either frog-type or solid concrete bricks can be produced at the rate of up to 14,000 in an eight hour day (on model C machine shown here) or up to 28,000 per day on the larger type A machine.

Smart operators find Jackson & Church units to be highly profitable installations. They eliminate the need for costly pallets. Gravel pit fines are ideal for brick making in a J & C press.

Below: Because of their even texture, sharp, square corners and perfect uniformity, Jackson-made bricks are winning the praise of contractors and architects from Maine to California.



Above: The Jackson and Church plant shown above was constructed of J & C made bricks. Producers find that J & C made bricks are easier to sell because of their uniformity, quality and appearance. J & C units produce plain or colored bricks from Haydite, Waylite, Superock, Pottsco, cinders and other light weight aggregates. From a single sack of cement, with a J & C machine, up to 320 concrete bricks can be made, with strengths as high as 3700 pounds per square inch and absorption as low as 6%. For complete information write to Jackson and Church Co., Saginaw, Mich.

JACKSON AND CHURCH COMPLETE BRICK-MAKING PLANTS

Won't Accept N.W.L.B. Check-Off Order

UNITED STATES GYPSUM CO., has told the world in large newspaper advertisments in various metropolitan centers that "the company is unwilling to accept a National War Labor Board order of May 31, 1943, to incorporate in its contract with the Union at Warren, Ohio, a clause establishing a form of closed shop called 'maintenance of membership' together with a check-off of Union dues and initiation fees from wages."

The following reasons are given:

"1. The War Labor Board has no authority to impose Union maintenance and check-off upon the Company. The Board is not empowered by Congress to order any employer to adopt this requirement. The Company's employees are being confused and deceived into believing that their Government desires them to join a labor Union when in fact the national policy, as declared by the Congress, is that employees are free to join or not to join as they wish. The Board is destroying the very essence of democracy, that is, the right of the people to make laws through their chosen representatives in Congress.

"2. Under this maintenance of membership form of closed shop employees would surrender their freedom to the Union and would not be free to resign from the Union. The Company would be compelled to discharge every Union member who fails to maintain his Union membership in good standing (non-payment of dues, non-payment of fines, etc.). Maintenance of membership is the starting phase in establishing the closed shop, which inevitably leads to a dictatorship.

"3. The order violates those fundamental principles of liberty which the Company and its employees now enjoy. The employee has the inherent right to work, and in doing so, should be free to join, to refuse to join, or to resign from a Union without losing his job. The Company has the right to be free to employ the person best suited for the work.

"4. The order requires the Company to discriminate against an employee in direct violation of the National Labor Relations Act. It requires the Company to interfere with the free choice of its employees to resign from the Union. It requires the Company to give support to the Union by a check-off of Union dues and initiation fees from wages. It requires the Company to discriminate against its employees if they resign their membership in the Union or if the Union declares them not in good standing.

"5. The Union appealed to the War Labor Board for Union maintenance and check-off because of the Board's established practice of granting these provisions in every case coming before the Board. The War Labor Board has no power to adopt any such standard practice in violation of the provisions of the Federal Constitution. Congress alone has the power to legislate.

"6. In view of the Board's attempt to legislate, we believed we were entitled to our day in court and demanded a hearing before the Board. This you denied and a majority of the Board (industry members dissenting) issued a directive order in disregard of our constitutional rights."

The advertisement states further that the Company has no other complaint against the N.W.L.B.'s decision, that it respects the right of its employes to join a Union.

The Warren, Ohio, plant of United States Gypsum Co., is a metal lath plant and does not manufacture gypsum products.

"TAILOR-MADE"
ROTARY KILN BLOCKS . .
or CONCRETE PRODUCTS
Your Days are Gone Forever
This New Circular Tells How!
Cement and Lime Manufacturers throughout the nation are rapidly adopting Clipper Masonry Saws for the fast and accurate way to better High Alumina or Magnesite Kiln Linings.
Concrete Products Plants have found Clippers enable them to complete orders for special shapes and sizes by converting standard units or salvaging damaged obsolete blocks.
Write for this latest information. . . . Today!
THE CLIPPER MFG. CO.
15 Hemp St.
St. Louis 10, Mo.

New Markets for Lightweight Concrete

Post-war reconstruction program will call for increasing use of light-weight aggregate concrete for housing and many new industrial uses

By GEORGE W. HOFFMANN

Two important and basic characteristics of concrete are favorably influenced by the use of light-weight aggregates in construction, using either monolithic concrete or concrete building-block.

1. The weight as compared with ordinary heavy concrete is reduced between 30 and 60 percent, which is very important where soft and sandy foundations require expensive footings for building construction and for structural steel fireproofing.

2. Concrete buildings are healthful because cellular, light-weight aggregates assure a natural control of temperature and humidity in a home, preventing penetration of moisture from the outside through the wall as well as condensation on the interior wall surface.

Of the many kinds of light-weight concrete aggregates, there are two basic types:

1. Natural aggregates.
2. Manufactured light-weight aggregates.

Of the natural light-weight aggregates, the best known is pumice, and certain scorias of volcanic origin. This material is available all over the world where land formations are of volcanic origin, such as most of South America (except Brazil), all of Central America, and our United States along the Pacific Coast and to the East, including Arizona and New Mexico.

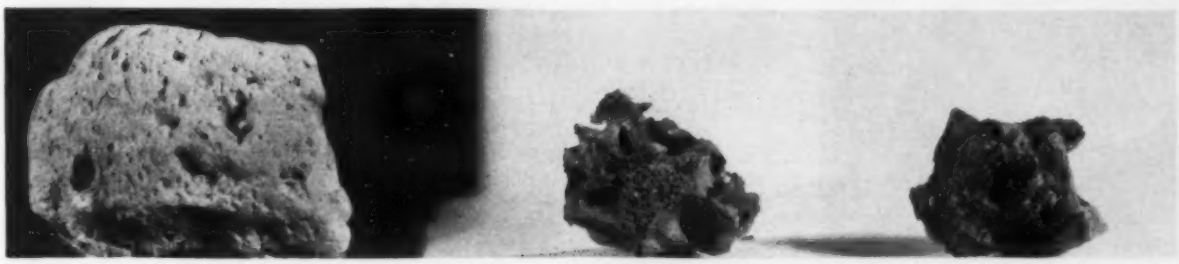
Pumice was originally molten lava discharged by volcanic eruptions. The composition of the respective lava stream and the manner in which it was emitted as well as the kind of water or swamp into which the lava

Enlarged photograph of white pumice shown in group photo. Note cellular structure

emptied has caused the great variety of pumice, ranging from snow white through brown and red colors to black. This condition makes it necessary to make a careful study and analytic tests with this material before recommending its use in the building industries.

While concrete made of white pumice aggregate has been known to be up to 60 percent lighter than a like volume of sand-and-gravel concrete, it has been proved that the insulation quality of a wall constructed of pumice aggregate concrete is close to the temperature conductivity figure for cork, known to be the highest rating insulation material so far known to man and accessible in comparatively large quantities, though not suitable for use as a structural building material. The "K" value (degree difference in temperature per inch of thickness per suare foot of surface per hour) of concretes of comparable density are: pumice-concrete from 2.25 to 3.0; manufactured lightweight aggregate concrete 2.5 to 4.0; cinder concrete 4.0 to 5.0, and ordinary heavy concrete ranging from 10.0 to 13.0.

To improve on this record, as far as the weight of the material is concerned, it should be interesting to state that research laboratory tests have exposed certain white pumice rocks to temperatures from 1200 to 1500 deg. F., creating a cellular, glass-like body that by volume resulted in a weight 90 percent lighter than an equal volume of sand and gravel. Such creations are purely laboratory results so far, however, their commercial possibilities cannot be denied when white pumice deposits may be available close to high temperature kilns of cement manufacturing type where they may be processed economically.



To the left, high-grade white pumice from California; center, a reddish brown escoria, of volcanic origin from northern Mexico; and to the right, a dark red escoria from New Mexico

Microscopic photograph of Waylite showing cellular structure of lightweight aggregate

Another outstanding laboratory test with screenings of certain white pumices passing 300-mesh has resulted in a bond similar to that of portland cement or lime, when mixed with water.

Other natural light-weight materials, such as asbestos, sisal fibers, wood shavings or sawdust have not yet proved their practicability for the manufacture of permanent load-bearing concrete masonry units or their use in monolithic or poured concrete construction.

Manufactured Light-Weight Aggregates

Manufactured light-weight aggregates originate from three different source of raw materials: (A) Graded and prepared cinders from anthracite and soft coal, (B) from molten blast furnace slag, (C) from clay and shale, and (D) expanded vermiculite.

(A) Cinders, resulting from the burning of coal in industrial plants, locomotives or gas plants, is one of the principal light-weight concrete aggregates used in the eastern part of the United States. In Latin America, because of the small amount of coal burning industries, this material is very scarce and in many countries is wholly impossible to secure.

Sample of coarse Celocrete concrete aggregate

To be used as a light-weight concrete aggregate, cinders must be carefully prepared. They must be stored for months, exposed to the weather. Thus, rain and air humidity will slake the lime deposits and wash the clinker clean of sulphur deposits and iron rust. This aging process is of great importance in order to avoid "popping" in cinder concrete walls or cinder block and discoloration due to sulphur or iron oxidation reactions.

(B) There are two types of light-weight aggregates made of slag. Molten blast furnace slag is the source of supply of light-weight aggregate in the South, East, and Mid-Western States where unlimited supplies at low transportation cost are obtained. This material is again subdivided into two types, resulting from a difference in manufacture as well as the conditions involving availability of raw materials. These two types are commonly distinguished as:

Blow torch subjecting Celocrete concrete block to heat to test insulating properties

1—The Dry Granulating process, used for manufacturing "Waylite" and "Superock." Waylite is an insulating, acoustical and light-weight aggregate manufactured by a patented process of heating and refining molten blast furnace slag. This process creates a profusion of cells spaced uniformly throughout the product. Each cell has a glass-like silica lining which permanently entraps a near vacuum, thus giving its high insulating value.

2—The Water Granulating process, which has been used for products known under such trade names as "Pottsco" or "Celocrete."

(C) The product known and enjoying world-wide patent protection under the trade name of "Haydite" is made from clay or shale. The freshly mined materials are cut into small lumps and fed into a rotary kiln. While moving toward the source of heat, the material expands and forms a cellular clinker which drops from the kiln at the point closest the flame, where it is chilled, and later crushed and graded for use as a light-weight concrete aggregate or for insulating roofs or wall cavities.

The manufacture of "Haydite" has some definite advantages. The initial capital investment is not large, and furthermore, it is known that clay and shale deposits suitable for the manufacture of "Haydite" are abundant in most parts of the Western Hemisphere. Another less-known product of this type is Gravelite.

Light-Weight Aggregate Concrete Mixing Formulas

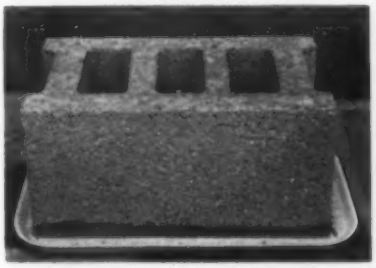
When using light-weight concrete aggregates, the method of mixing is very different from that of ordinary heavy concrete. It is essential to coat the entire surface of each coarse and fine particle so that cement will not accumulate in a dry form in the cavities of the aggregates but will seal such cavities.

The majority of operators using light-weight concrete employ the spiral blade type batch mixer. The mixer is filled with a given volume of materials and two-thirds of the necessary mixing water is added to the material which is mixed for six min-

Coarse size of Haydite enlarged to show cellular structure

utes; then the cement and the last third of the mixing water is added for a final four minutes' mixing in the batch mixer.

A successful method of mixing light-weight aggregate has proved to be the use of two mixers. While the fine and coarse materials are mixed with two-thirds of the mixing water



After submerging 24 hours in water, the penetration of moisture is restricted to a very small area (Haydite block)

in the spiral blade batch mixer, the proper proportion of cement is mixed with one-third of the water in an open drum mixer. After five minutes' separate mixing the drum mixer is emptied into the batch mixer where the mixing process is continued for another five minutes, resulting in an absolutely homogeneous mix that has tested to the highest loadbearing strength and has permitted the greatest saving in portland cement.

In conclusion, it is interesting to note that at present out of approximately 4000 concrete masonry plants in the United States, one-third use light-weight concrete aggregates either wholly or in part for the manufacture of masonry units. With many plants adding light-weight concrete block to their standard sand-and-gravel line, the increase in manufactured aggregate sales is most noticeable.

Europe has had a much longer experience with the use of light-weight aggregate concrete, and has found many structural uses for the product. Comparatively large structural units have been made of this material and they have stood the test of time over a long period of years.

Many new uses are being made of light-weight aggregate concrete block. Thousands of motor test cells for airplane engine manufacturers are made of these units. Acoustical qualities of these blocks are employed in many new war factories, hospitals, and Army barrack structures.

Light-weight aggregate concrete also is employed extensively in the manufacture of concrete joists, floor, roof slabs, and channels. One of the most interesting new uses for manufactured light-weight aggregate concrete is for the construction of concrete ships.

There is no doubt that the great world reconstruction program will offer an opportunity to further increase the use of light-weight aggregate. For the small difference in cost, the advantages of these cellular insulating materials are outstanding.

Construct Concrete Products Plant in Washington

C. R. JESSEN AND J. C. WRIGHT CONSTRUCTION CO., Salt Lake City, Utah, has installed equipment and placed in operation a concrete products plant near Kennewick, Wash. The plant makes concrete pipe and block for use on the Richland project. About 75 men are employed, and a carload of cement is used daily.

Temporary Cement Plant Shut-downs

PENNSYLVANIA-DIXIE CEMENT CORPORATION has shut down its Portland Point, N. Y., and Bath, Penn., plants with bins full. Operations will be resumed when demand picks up.

May Build Block Plant

D. L. WHEELOCK, Clay Center, Kans., has been negotiating in Great Bend, Kans., for the establishment of a branch concrete products plant. There have been many inquiries from farmers in western Kansas who desire to use concrete block for farm buildings.

Study Economic Development

W. G. PERROW, manager of the Lehigh Portland Cement Co., Metaline Falls, Wash., has been named community chairman in Spokane for the committee for economic development. This announcement was made by Kinsey M. Robinson, president of the Washington Water Power Co. and chairman of the Inland Empire district for the committee. Mr. Robinson explained that the committee for economic development has been organized nationally under the chairmanship of Paul G. Hoffman, president of the Studebaker Corp., to assist business and industry to plan for high levels of employment and productivity in the post-war period. Eric A. Johnston, president of the United States Chamber of Commerce, is one of a board of trustees of nationally prominent business men directing the committee. Mr. Johnston is chairman of the Washington Brick and Lime Co., Spokane, Wash.

43%

OF ALL CONCRETE MASONRY WAS "LIGHTWEIGHT" IN 1942

This Statement Is Not So Startling When You

Surface of aggregate magnified 3½ times to show nature of cell structure.

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LOWEST AGGREGATE COSTS **because of volume of six large tonnage plants located to serve the East, South and Middle West.**

LOWEST FREIGHT COSTS **because *WAYLITE* is lighter in weight and manufactured dry—no freight on water.**

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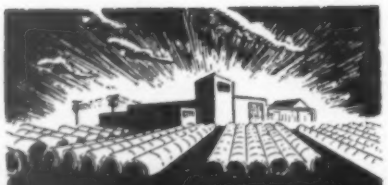

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Complete
EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.
G. M. Friel, Mgr. COLUMBUS 8, OHIO

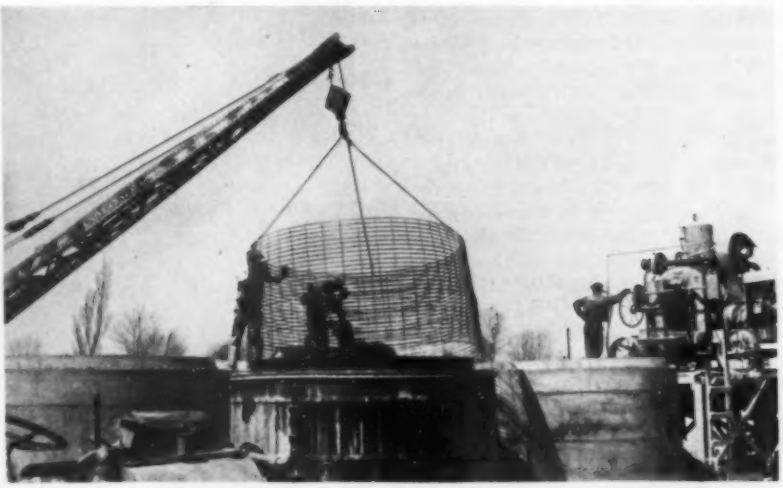
Concrete Pipe

(Continued from page 86)

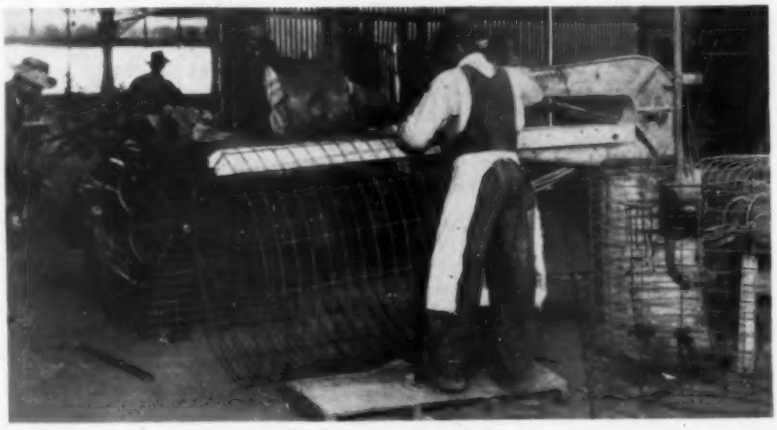
attractive during the hotter days as it rests under a convenient shade tree.

The main offices of the Choctaw Culvert and Machinery Co. are at 491 S. Second St., Memphis, Tenn. O. H. Miller is president; Jim Wood, vice-president and sales manager; E. F. Bespalow, chief engineer and manager of the concrete pipe division of the company.

Workman putting finish touches to pipe reinforcing. Note large mixer at the end of platform runway for wheelbarrows hauling concrete



Lowering steel reinforcement for 9-ft. concrete pipe into form before placing concrete



Automatic electric spot welder for welding reinforcing for pipe

From Blocks to Welding

ISLAND DOCK, INC., Kingston, N. Y., which, among other activities, has been manufacturing concrete block,

Walter Westfall

has been engaged in shipyard work. As an example of the versatility of its workmen, Walter Westfall, who has been the company's master block maker, is now a top-notch welder and burner in the shipbuilding end of the business.

Commercial Standard for Mineral Wool

THE NATIONAL BUREAU OF STANDARDS advises that printed copies are now available of Commercial Standard CS105-43 for mineral wool, loose, granulated, or felted, for use in low-temperature installations. It is designed to improve the quality of mineral wool and to set up installation requirements to be followed in insulating refrigerated compartments or cold areas. This voluntary standard was proposed in April, 1942, by the Industrial Mineral Wool Institute. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5c each.

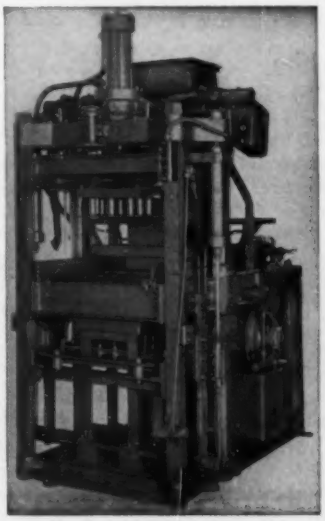
Pavement Yardage

AWARDS of concrete pavement for May, 1943, have been announced by the Portland Cement Association as follows:

Awarded During May, 1943

	Sq. Yds.
Roads	1,345,811
Streets and Alleys	785,172
Airports	5,711,179
Total	7,842,162

HYDRAULIC VIBRA-PRESS



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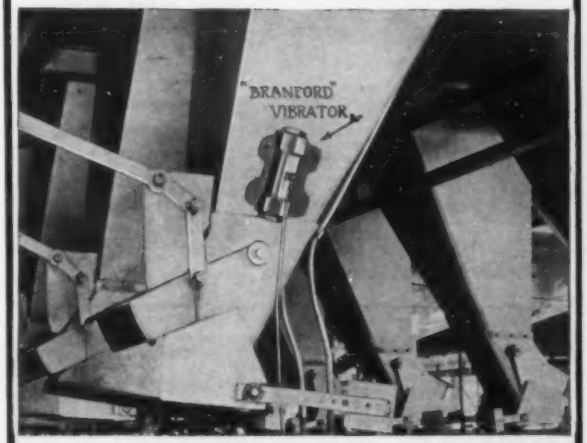

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Application of Price Ceilings in the Aggregates Industry

BY FAR ONE of the most helpful discussions of the recent Cleveland war conference of the National Sand and Gravel Association and the National Ready-Mixed Concrete Association was that on the application of price ceilings to these and similar industries, such as Slag and Crushed Stone. NEIL STAEBLER, price executive, Building Materials Branch, Office of Price Information, is the authority who gave the answers to some questions uppermost in the minds of many producers. Mr. Staebler's address was largely a defense and explanation of O.P.A., consisting of generalities with which those who read are more or less familiar, but his answers to specific questions were enlightening and appeared to satisfy questioners. The whole discussion has been made available to members of the two associations; here we will attempt to condense it to the bare essentials, in the hope and expectation that such a condensed version will be more widely read—and absorbed.

Pricing at Project Plants

QUESTION: A temporary plant is erected to serve a defense job. What obligation does the producer have in regard to price control in connection with sealed bids?

ANSWER: When the sale is direct to a Federal Government agency, the producer (the successful bidder only) must file MPR 188 within 10 days after the formulation of the contract. The operation is classified as a new plant for which maximum prices have not been established. Sales at the contract price are tentative until approved by O.P.A. If O.P.A. sets a lower price the difference must be refunded.

Where the sale is not direct to a Federal Government agency but to a construction contractor, the producer must apply the prescribed method for pricing as directed for civilian supplies, unless there is danger of delaying important government projects, in which case the producer uses Procedural 6. Procedural 6 provides that the producer may petition for a change in price (or a new price) and at the same time begin selling at the requested price on a tentative basis, subject to confirmation or other action by O.P.A.

MPR 188 and Procedural 6 forms are obtainable at any local O.P.A. office and are filed there.

IMPORTANT: When a sealed bid is made directly to the Federal Government, no request is made for price approval until the bidder receives the contract. When a sealed bid is made to a contractor for a Federal Government project, the bidder must secure approval of his price *before he enters his bid.* Otherwise he is in violation of the price regulations. This, of course, applies *only* to new plants, or new products, not in the case of a bidder using an already established maximum price.

Extra Service Charge

Where the producer has established a price for ordinary deliveries and is called upon to serve a rush job with night-time, Sunday or holiday deliveries, which involve overtime pay, he is rendering a *new service* within the meaning of the O.P.A. regulations, and he can get a new maximum price to include that service, using the same mark-up he would for other services, stated in dollars

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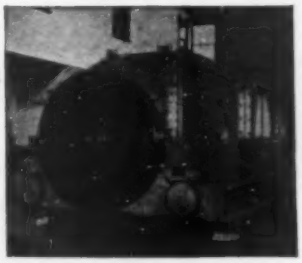
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are some of the outstanding advantages which this REVERSIBLE Hammermill will provide in the Secondary Preparation for modern Raw Side Grinding Mills.
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and cents, not percentages. Use form MPR 188, if the sale is direct to the Federal Government, Procedural 6 if to a contractor for the government.

Pricing at Established Plants

QUESTION: What is the procedure with reference to materials delivered to a project, sold to the contractor, when the materials come from an established plant not located on or immediately adjacent to the project?

ANSWER: If the producer has been selling large contractors at a price lower than small contractors, then he has clearly established different classes of buyers. If he has customarily done that, if he did it in March, 1942, if he sold some large contractors at different prices than some other large contractors, the question arises: Is that a class within a class, a subclass, if you will? There it depends first, upon the facts in every case. Did he customarily make any difference between the middle-sized buyer and the biggest buyer? Is there any difference in volume in the way he priced his sales? Is there any question about the location of them? Did he follow any uniform practice regarding credit?

If there are no uniformities that indicate classes of buyers and the producer can demonstrate that he merely priced in some cases at a lower figure because one man was a better bargainer than another, the question arises: Did he habitually sell the better bargainer at a price differential? In other words, if he sold the Johnson Contracting company always 5 percent cheaper than he sold the Brown Contracting company, then he has established a class, but if on some deals he sold 5 percent lower and on some deals he sold at the same price, and if it was a case of bargaining from deal to deal, and there was nothing customary about his procedure, then he may use the highest price that he charged to members of a particular class as the ceiling for all members of that class.

Winter Operation and New Sales Territory

QUESTION: A sand and gravel producer who has never operated through the winter, and has shipped only small amounts from stockpiles in March, 1942, is required to operate the plant and make shipments to the contractor of an important government project in the winter of 1942-43, and into territory never before served. How is the price determined? Former practice was of course to sell at the seller's own price; the desire now is merely to recover additional costs.

ANSWER: The producer can use Procedural Regulation 6 to give him immediate relief. This will permit him to sell on a tentative price basis. At the same time, he should apply under MPR 188 for a delivered price in the new locality. MPR 188 applies not only to new products but also to old products sold in new localities and requires the establishment of a price on an old product when sold in a new locality, that is, if a price is requested that differs from the established maximum price for comparable commodities in the new locality. Where a seller has established differentials under MPR 188 and his new quotation is in accordance with his system of established differentials, no prior approval of his price is required by O.P.A.

To Increase Price with Increased Labor Cost

QUESTION: In the matter of price increases where wages are the cause, it was mentioned that the time element enters into it, 15 days after application is filed. Let's say the local office of the Wage and Hour Division transmits it to the National War Labor Board. Now the man who is going to file on the basis of the increased wages is not aware within 15 days or within 30 days or perhaps within 45 days, and it may go to two or three months, that these increases are going to be approved by the National War Labor Board. Therefore, he has no basis upon which to establish what his increase might be. The amount of the increase has not been determined. The agreed on amount may not be approved, and therefore he has no basis on which to set forth to O.P.A. the actual amount that he wants to increase his prices.

ANSWER: If the purpose of the filing by the employer is explained it will be readily understood that the fact that you cannot file all of the information in final form is not of major importance. O.P.A. requires that you file your petition for a price increase within 15 days after a wage case is presented to the War Labor Board in order that O.P.A. may start to study the case at the earliest possible time so that when a wage increase is finally recommended by the War Labor Board the O.P.A. will not have to delay its effective date unnecessarily by commencing detailed investigations. You should, therefore, within the 15-day period, file your petition with the O.P.A. setting forth the information required in Supplementary Order 28 and the particular regulation under which you seek an adjustment. This information can indicate your general profit position, the importance of labor costs to your

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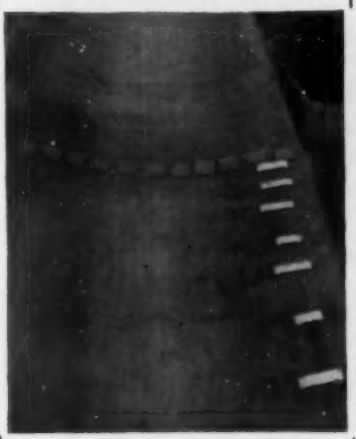

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total production costs, and other information which you believe to be relevant to the determination of whether or not the price increase will be required. Of course, you will not know the exact amount of wage increase which the War Labor Board will recommend. Your figures should, however, be prepared on the basis of the wage increases which the War Labor Board is requested to grant. If the War Labor Board grants a wage increase other than that requested, you may file supplementary information in connection with your petition, and, of course, O.P.A. will base its decision upon the wage increase that was actually granted. Likewise if other crafts are brought into the wage proceeding after you have filed your petition with O.P.A. you are at liberty to file supplementary data with respect to your petition. The important thing is to put before O.P.A. all of the facts which you possibly can at the earliest possible time so that the proceeding will not be delayed in the final stages by fact-finding investigations.

Cement Production Lower

BUREAU OF MINES reports that production of 11,239,000 bbl. of finished portland cement in April was one-fifth below output in April, 1942, and contrary to the usual seasonal pattern, was slightly lower than in March, 1943. The effect of seasonal influences at this time of the year is indicated by the fact that average April output during the 1935-39 period was 33 percent greater than the average for March, 1935-39. The continuation and the increasing severity of the declines in production noted for February, March and April of 1943 from similar months of 1942 leaves no doubt that the long uptrend was reversed sharply in February, 1943. Shipments from mills during April and the January-April periods of 1943, declined respectively 14 and 10 percent from similar periods of 1942. For the first time in 1943, monthly shipments exceed production with the result that stocks of finished cement on April 30 were 10 percent lower than on March 31.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of April, 1943, and of April, 1942:

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	Apr. 1942	Apr. 1943	Mar. 1943	Feb. 1943	Jan. 1943
The Month	69.0	55.0	54.0	54.0	60.0
12 months	70.0	72.0	73.0	74.0	74.0

Gravel Plant for Grand Coulee

A NEW GRAND COULEE DAM gravel plant is now under construction in the old rip rap quarry east of the mixing plant. A "mountain" of sand is still available from C. B. I. operations which will meet all possible needs. The gravel plant will comprise three units, the feeding and conveying section, primary crushing and screening, and secondary screening and storage.

COMING CONVENTIONS

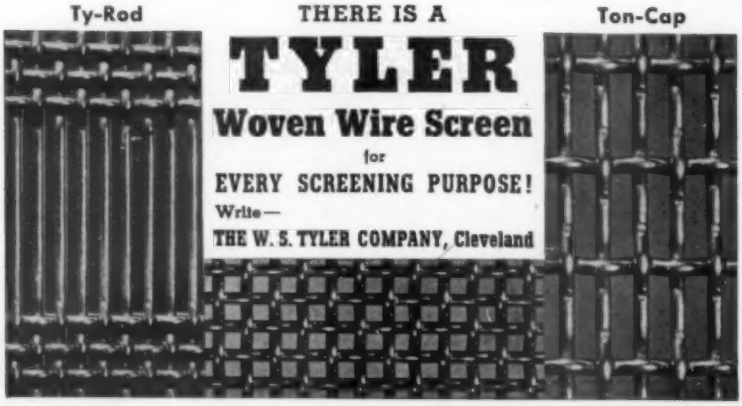
National Crushed Stone Association, Directors' Meeting, The Homestead, Hot Springs, Va., July 29 and 30, 1943.

American Society for Testing Materials, Hotel William Penn, Pittsburgh, Pa., June 28 to July 2, 1943.

Chemical Industries Exposition, Madison Square Garden, New York, N. Y., Dec. 6 to 11, 1943.

Ty-Rod THERE IS A Ton-Cap

TYLER
Woven Wire Screen
for
EVERY SCREENING PURPOSE!
Write—
THE W. S. TYLER COMPANY, Cleveland



Sand-Lime Brick Production and Shipments

Five active sand-lime block and brick plants reported for May and five for April, statistics for which were published in June, 1943.

AVERAGE PRICE FOR MAY

	Plant Price	Delivered Price
Detroit, Mich	.....	$16.00
Pontiac, Mich.	$13.00	.....
Grand Rapids, Mich.	.....	15.00
Seattle, Wash.	16.50	18.50
Mishawaka, Ind.	13.00	.....

STATISTICS FOR APRIL AND MAY

	*April	†May
Production	822,500‡	1,066,000
Shipments (rail)	150,000	195,000
Shipments (truck)	913,500	896,898
Stock on Hand	319,930	392,780
Unfilled Orders	930,000	1,300,000

*Five plants reporting: incomplete, one not reporting stock on hand and one not reporting unfilled orders.

†Five plants reporting: incomplete, one not reporting production and three not reporting unfilled orders.

‡25,000 sand-lime brick. 5,000 cement block.

Quarry Plant Fire

LIBERTY LIMESTONE CORPORATION, Buchanan, Va., is rebuilding its crusher plant which was recently destroyed by fire with a loss of $50,000. The plant has employed as many as 75 men in three shifts.

PULVERIZERS for the reduction of Cement Materials, Limestone, **Agricultural Limestone,** Fire Clay and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour — Finenesses: 20 to 350 mesh

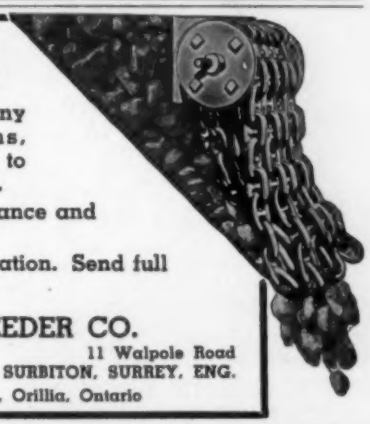
BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—
To Reduce Power and Maintenance Costs—
To Insure an Absolutely Uniform Product—

***Use the* BRADLEY AIR SEPARATOR**

THE ROSS FEEDER



Completely controls the flow of any size material from Storage Bins, Hoppers or Open-Dump Chutes to Crushers, Conveyors, Screens, etc.

High in efficiency. Low in maintenance and power consumption.

Furnished in sizes to suit your operation. Send full particulars for recommendation.

ROSS SCREEN & FEEDER CO.

19 Rector Street, NEW YORK, U. S. A. — 11 Walpole Road, SURBITON, SURREY, ENG.

Canadian Licensee: E. Long, Ltd., Orillia, Ontario

AN END TO CLOGGING

Equip your vibrating and shaking screens with Hendrick Perforated Plate and you can eliminate clogging troubles—the full clearance insures better, finer screening.

Hendrick Perforated Plate for vibrating and shaking screens is available in practically any size or shape of opening and in a variety of metals, particularly Hendrick High Carbon, Heat Treated Steel.

Write for complete data.

HENDRICK MANUFACTURING CO.

47 Dundaff St., Carbondale, Pa.

SALES OFFICES IN PRINCIPAL CITIES

PLEASE CONSULT TELEPHONE DIRECTORY

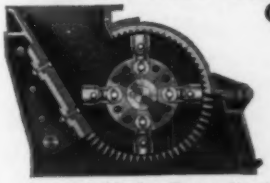
Makers of Elevator Buckets of all types. Mitco Open Steel Flooring. Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.

GRUENDLER CRAFTSMANSHIP

Employed by U.S.A. in the WAR EFFORT

HAMMER MILL CRUSHING and GRINDING EQUIPMENT

for—Heavy Ores, Chemicals, Bauxite and ROCK Products



A size built for Every Need

Gruendler Features:

MOVING TRACK BREAKER PLATES.
For Wet, Sticky Materials.

TRAMP METAL TRAPS
Full Protection to Crusher.

Developed by Engineers who have made a Life Study of the Hammer Mill Principle for Material Reduction keeping in step wth new features to meet the demands for greater efficiency and speed.

Write for Bulletin on Our Large Capacity Hammer Mills

GRUENDLER CRUSHER & PULVERIZER CO.

PLANT and MAIN OFFICE—2915-17 N. MARKET • ST. LOUIS, MO.

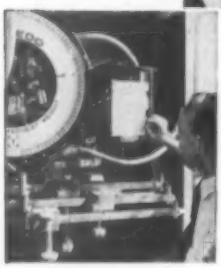
SC² PRECISION CONCRETE CONTROL

IMPROVES QUALITY
REDUCES COST

Attaches to your Weigh Hopper

Moisture Meter

The only unit capable of determining moisture content in ONE minute.



Compensator

Delivers correct DRY weight of aggregates and ADDED water. Makes a graph record of EVERY BATCH.

SC² CONTROL produces remarkable uniformity. Is always approved by concrete engineers. Has definite sales value. Write for our booklet "PROFITS IN CONCRETE."

SCIENTIFIC CONCRETE SERVICE CORP.
McLachlen Bldg., Washington, D. C.

OBITUARIES

HENRY H. TITSWORTH, chairman of the board of the Glens Falls Portland Cement Co., Glens Falls, N. Y., passed away recently at the age of 68. He recently resigned as president of the company because of ill health. Mr. Titsworth was born in Westfield, Mass., and was graduated from Amherst College in 1897. He had homes at Glens Falls, N. Y., and Randolph, Va.

•

J. G. STADLER, a chemist at the Iola plant of the Lehigh Portland Cement Co., Iola, Kan., for more than 35 years, died recently at the age of 59. Mr. Stadler was born in Kansas City, Mo., and received most of his education there. He came to Iola as an assistant in the chemical laboratory of the Lehigh company in 1907 and subsequently became a chemist at the plant.

•

ADAM VOGEL, who for 16 years was in the concrete block business with his brother, under the firm name of Vogel Bros., Milwaukee, Wis., died recently at the age of 55.

EDWARD H. ROCKWELL, former director of the division of civil engineering at Lafayette College, died at Easton, Penn., recently at the age of 71. Professor Rockwell spent 52 years as an engineer and teacher until his retirement a year ago. He was graduated from Worcester Polytechnic Institute in 1890. In 1902 he was appointed professor at Tufts College, where he remained for 20 years. Then he became dean of the College of Civil Engineering at Rutgers University and in 1928 went to Lafayette as director of the division of civil engineering. Professor Rockwell was one of the first to become interested in vibrations from quarry blasting. He was retained for several years by the General Crushed Stone Co. to investigate alleged damage to buildings and served as expert witness in many other instances.

•

G. ALLAN RUTHERFORD, vice-president of the Eau Claire Sand and Gravel Co., Eau Claire, Wis., died recently at the age of 51.

•

FRED A. HAYES, owner of the Hayes Sand and Gravel Pit, Sioux Falls, S. D., passed away recently at the age of 82.

New Products — — New Profits with AMERICAN CRUSHERS

THERE is increasing demand for carefully graded stone sand of round grains and coarse aggregates that will be free from slivers. Plant managers are cashing in on these profitable markets with AMERICAN CRUSHERS—built to give trouble-free, long-lasting service, to produce more volume and more variety at lower operating cost.

Let us show you how you can benefit by installing an AMERICAN. Write for information.

AMERICAN PULVERIZER CO.
1245 Macklind Ave. St. Louis, Mo.

HAYWARD BUCKETS

USE RIGHT BUCKET FOR THE JOB

Hayward makes all four—clam shell, dragline, electric motor, orange peel. A Hayward recommendation is unprejudiced.

THE HAYWARD COMPANY
202-204 Fulton Street
New York, N. Y.

SUPER-LOY
WOVEN WIRE SCREENS

LUDLOW-SAYLOR
WIRE CO. ST. LOUIS

JOHN MEYER, secretary of Sauerman Bros., Inc., Chicago, Ill., died recently at the age of 46. Mr. Meyer was born in Chicago and was engaged in railroad construction and engineering work in that city before joining the Sauerman organization as production manager in 1929. He was elected secretary of the company in 1942.

•

H. H. SCHONBERG, owner and general manager of the Medary Sand and Gravel Co., LaCrosse, Wis., passed away recently.

•

C. H. STUTZ, traffic manager for the National Cement Co., Birmingham, Ala., died recently at the age of 51, following a short illness.

•

L. H. HARTMAN, former head of the Valve Bag Co. of America, which was sold to the St. Regis Paper Co., passed away recently. Mr. Hartman was host to the National Lime Association on many joyful occasions.

•

L. H. GODFREY, president, T. T. Wilson Co., Chattanooga, Tenn., aggregates and ready mixed concrete producers, died recently. The business is being carried on by Mrs. Godfrey until it is sold.

W. HARSCHEL NEAL, superintendent of the Bloomington Limestone Co., Kokomo, Ind., died recently at the age of 48.

Manufacturers' News

Western-Austin Co., Aurora, Ill., has been awarded the Army-Navy "E" pennant for excellence in production of war material. The pennant was officially presented to McClure Kelley, president of the company, at impressive ceremonies at the Farnsworth Avenue plant.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the appointment of Frank C. Angle as manager of the entire Pacific region, which includes California, Oregon, Washington, Nevada, Utah, Idaho and the western part of Montana and Wyoming. Mr. Angle has been manager of the San Francisco district office for the past seven years.

Stewart-Warner Corp. Chicago, Ill., one of the first Chicago manufacturers of war material to receive the Army-Navy Production Award, has now received the "E" award for the second time "for meritorious services on the production front."

Mack Trucks, Inc., Long Island City, N. Y., has announced removal of the executive offices from quarters in the company's Long Island City plant into new offices in the Empire State Building, New York, N. Y., after an absence of seven years. The company recently expanded its truck and marine engine production lines at Plainfield and New Brunswick, N. J., and at Allentown, Penn., by acquiring factories in and near those cities.

Make Your Screening Surfaces More Effective with
HARRINGTON & KING
PERFORATED METAL SCREENS
Their perforations are properly spaced to give greatest capacity without loss of strength and durability. Any size, any shape, any metal, any perforation.
Write for illustrated catalog

The Harrington & King PERFORATING CO.

5650 Fillmore St., Chicago 44, Ill.
114 Liberty St., New York 6, N. Y.

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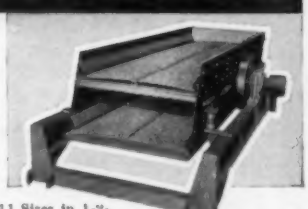
DIAMOND

Violent vibration for fast, positive separation *all over* the screen—controlled by accurately balanced design for smooth action. Long life, low maintenance costs. No choking. Fast delivery. Tell us your needs. Write for Bulletin D42V.



11 Sizes in 1-2-2½-3-4 Decks

DIAMOND IRON WORKS, INC.

1800 North Second St., Minneapolis 11, Minn.

WILFLEY
centrifugal SAND PUMPS

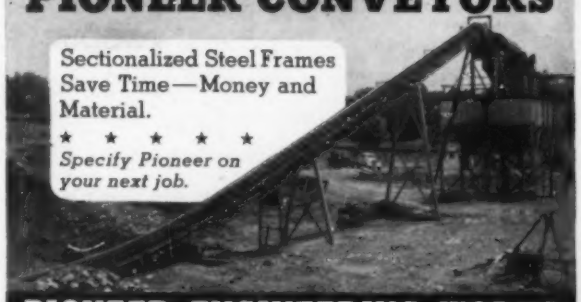
for Slurries, Sand Tailings Slimes, Acid Sludges

Save Pumping Cost

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. *Write for Complete Catalog*

A. R. WILFLEY & SONS, Inc. Denver, Colo., U. S. A.
NEW YORK OFFICE: 1775 BROADWAY

PIONEER CONVEYORS



Sectionalized Steel Frames Save Time—Money and Material.

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Specify Pioneer on your next job.

PIONEER ENGINEERING WORKS
1515 CENTRAL AVE. MINNEAPOLIS, MINNESOTA
Manufacturers of Quarry, Gravel Pit and Mining Machinery

UNIVERSAL SCREENS
and
"UNIVIBE" RIDDLES

Complete line of—
Tried, Proved and Guaranteed Vibrating Screens. Since 1919, the BEST in screening equipment at the LOWEST COST.

NEW! 32-page Catalog on Screens and Screening. Just ask for Catalog No. 107.

UNIVERSAL VIBRATING SCREEN CO.
RACINE - - WISCONSIN

General Electric Co., Schenectady, N. Y., has appointed W. A. Mann assistant manager of the industrial division, central district, Chicago, Ill.

Bemis Bro. Bag Co. plant at St. Louis, Mo., has been awarded a handsome bronze plaque by the St. Louis Safety Council. The big company made the remarkable record of operating 1,192,912 man-hours in 1942 without a single lost-time accident.

SKF Industries, Inc., Philadelphia, Penn., has announced the appointment of Robert R. Zisette as general sales manager. Mr. Zisette received his degree of Mechanical Engineer from Yale University in 1921, the same year that he started with SKF. After one year in engineering and sales departments, he became sales engineer in the Cleveland office. Seven years later he was promoted to district manager of the Cincinnati office. In 1942 he became assistant sales manager.

Iron & Steel Products, Inc., Chicago, Ill., dealers in second-hand machinery, equipment and materials, are conducting a contest for symbol or illustration typifying that anything iron or steel is more dependable after having been tested in actual usage, service-tested, than new or unused. A $100 War Bond is the prize.

Universal Engineering Corp., Cedar Rapids, Iowa, has been awarded the Army-Navy "E" pennant for high achievement in the production of war material.

Iron & Steel Products, Inc., Chicago, Ill., announces the following changes in management: Frank Parker, chairman; Albert G. Bladholm, president; John F. Parker, vice-president and treasurer; William J. Parker, vice-president and secretary; Royal J. Casper, assistant secretary.

Atlas Powder Co., Wilmington, Del., announces that J. C. Costello has been appointed manager of the company's Giant Division sales offices with headquarters at San Francisco, Calif. Mr. Costello succeeds Weston G. Frome, who has become assistant general manager of the Explosives Department, located at Wilmington, Del.

The B. F. Goodrich Co., Akron, Ohio, has named Dr. Frank K. Schoenfeld as technical superintendent of the chemical division. Dr. Schoenfeld goes to his new post after many years of specializing in the development and application of Koroseal.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed L. W. Long as sales engineer in charge of mixed apparatus sales. Mr. Long joined Allis-Chalmers in 1925 and until his appointment served as sales engineer in the Pittsburgh office. He is an electrical engineering graduate from Penn State University and is a member of the A.I.E.E.

Wickwire Spencer Steel Co., New York, N. Y., announces that its Palmer, Mass., wire rope plant has received its first gold star from the United States Maritime Commission. This announcement was made by E. C. Bowers, president of the company. Last October this plant received the first Maritime "M" awarded to any plant in New England and at that time "M" badges were given to the plant's 1500 employes.

Climax Engineering Co., Clinton, Iowa, has announced the purchase of the McAlear Manufacturing Co., Chicago, Ill., producer of valves, regulating and control equipment. Edward F. Deacon, Climax president, also will be president and general manager of the McAlear Co., according to an announcement jointly issued by Mr. Deacon and Owen L. Coon, chairman of the board of General Finance Corp., of which both companies are now subsidiaries. Mrs. P. G. McAlear, formerly president and now chairman of the board of the McAlear Co., will continue to be actively identified with the management.

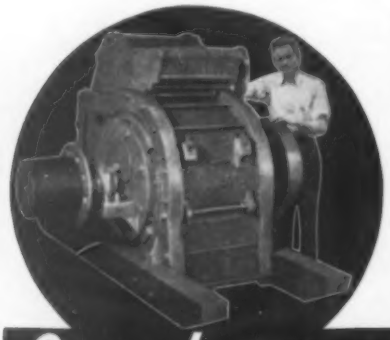
Farrel-Birmingham Co., Inc., Ansonia, Conn., and Buffalo, N. Y., announces the election of John Wolcott Haddock as president of the company. Mr. Haddock was formerly vice-president of the Sullivan Machinery Co. of Claremont, N. H., and Michigan City, Ind. He is a member of the American Institute of Mining and Metallurgical Engineers, and is active in the affairs of the Compressed Air Institute and the American Mining Congress, having been chairman of the Manufacturers' Division of the Congress during the past year.

American Brake Shoe and Foundry Co., New York, N. Y., has shortened its name by dropping "and Foundry" and will be known from now on as the American Brake Shoe Co.

New Incorporations

Nelson Mica Corp., Roanoke, Va., has been granted a charter to conduct a mining business, with a maximum capital of $25,000. A. L. Nelson, president; Charles Evant Hunter, attorney, 703-7 Shenandoah Life Building, Roanoke.

American Mica and Mining Co., Raleigh, N. C., with principal offices in Spruce Pine, N. C., has been incorporated to mine and manufacture minerals, with a capital stock of $50,000. Incorporators are Wm. G. Smith, Jr., New York, N. Y.; Jeane Faulkner, Rye, N. Y.; Mats E. Berg, Spruce Pine, N. C.; Sam N. Vose, Boston, Mass.; and Carl Bison, New York, N. Y.



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Swing Hammer PULVERIZER

Its wide crushing range makes it serve the purpose of two or more other types of crushers. Roller bearing equipped. Write for Bulletin.

Brooks EQUIPMENT & MFG. CO. KNOXVILLE TENNESSEE

New and Rebuilt Equipment

KILNS, COOLERS, DRYERS, CRUSHERS, TUBE MILLS, CRANES, ETC.
MOTORS, GENERATORS AND ELECTRICAL EQUIPMENT

Inquiries invited. Consult us regarding your equipment problems. For prompt action, wire or phone.

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17 EAST 45TH STREET NEW YORK
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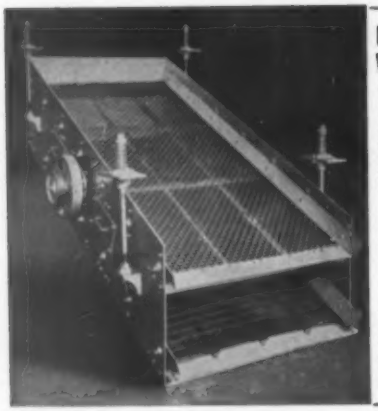

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The Denver-Dillon Vibrating Screen has been proved by over four years of service in numerous industries. Operators report definite reduction in screening costs. "Floating circle" principle requires less than half of the average power of other means of screening. Write today for new Bulletin No. 83-B3.

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New York, N. Y., 50 Church St.
Salt Lake, Utah, McIntyre Bldg.
Chicago, Ill., 1005, 69 W. Wash.
Toronto, Ont., 45 Richmond St.
Mexico, D. F., Edificio Jalisco

Men Who Are Getting Ahead in the Rock Products Industry Are Reading ROCK PRODUCTS, the magazine that is written for you. Keeps you posted on news of the industry, new developments, new opportunities, methods used by others, adaptable ideas. A valuable asset to you.

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TWO YEARS only $3.

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INFORMATION—Box numbers in care of our office. An advertising inch is measured vertically in one column. Three columns, 30 inches to the page.

CLASSIFIED—Displayed or undisplayed. Rate per column inch, $5.00. Unless on contract basis, advertisements must be paid for in advance of insertion.

FOR SALE

TEAM UP FOR VICTORY with "CONSOLIDATED"

BALL AND TUBE MILLS

2—UNUSED 7'x23'9" Tube Mills, iron lined, each including 400 H.P., 3/60/2200 v. slip ring motor and starting equipment.
1—5'6x21' Smidth Tube Mill, iron lined.
2—5'x20' Bonnot Tube Mills, silex lined, cast steel heads for direct gear drive.

DIRECT HEAT ROTARY DRYERS

3—4'x30' Ruggles-Coles, now at Rochester, N. Y.
1—5'6x34' Iroquois, made by Lancaster Iron Works, at Newark, N. J.
1—5'x30' Cummer. Now at Newark, N. J.
2—6'x50' Traylor Eng. & Mfg. Co.
4—5'x40' Ruggles-Coles, single shell. Now at Boston.

RAYMOND PULVERIZERS

3—4 roll low side Mills, each with fan, cyclone, interconnecting piping.
1—5 roll high side type, with "whizzer" separator and everything complete, including motors, steel supports, etc.

HARDINGE CONICAL BALL MILLS

1—4'6x16" iron lined, with A.C. motor and silent chain drive.
1—6'x22" iron lined, with silent chain drive, with or without motor.

ROTARY KILNS

2—8'x125' Vulcan Iron Works.
1—7' & 8'x80' Traylor.
4—5'6x7'x80' Vulcan and Reeves.
1—5'x50' Vulcan.

CRUSHING ROLLS

1—20"x14" Sturtevant, full balanced type.
1—Set 36"x16" Sturtevant.
2—40"x16" Colorado Iron Works.
1—42"x16" Allis-Chalmers.

WASTE HEAT BOILER PLANT

4—750 H.P. Edgemoor Waste Heat Boilers, all ASME, last insured for 300 lbs. working pressure. Including super-heaters, economizers, fuel fans, boiler feed pumps, steel stacks, feed water heater, etc. All in one installation and in good operating condition.

FOR 25 YEARS A SYMBOL OF CONFIDENCE

CONSOLIDATED PRODUCTS COMPANY, INC.
15-16-17 PARK ROW NEW YORK, N. Y.
Shops and Yard at Newark, N. J., cover eight acres.

BELT CONVEYORS IN STOCK

12"—14"—16"—18"
20"—24"—30"—36"

ALSO

CONVEYOR BELTING

1943 Catalog No. 44 on Request

"The test of time since '99"

TEUSCHER PULLEY & BELTING CO. 801 N. 2nd ST., ST. LOUIS, MO.

CRUSHERS

GYRATORY: 42" Gates K. 20" Superior McCully (Like new). 20" Superior McCully. Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 6C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.
JAW TYPE: Traylor 60x84, 42x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 15x36.
REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 8-F & 40. Traylor 36" TZ, 8", 10", 12". Super. McCully 6" & 10". Newhouse 5, 7 & 10". Symons Cone & Disc Ty. 2' to 4'.
ROLLS: Allis-C. 12½x12, 36x10, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16, Etc., Etc.
HAMMERMILLS: Williams No. 1, 2, 3, 4, 8 & 9. Jeffrey 26x18 & 36x42. Day Nos. 30 & 40., Etc.
MILLS: Kennedy Ball 4x6, 5x6 & 5x8. Marcy 8x6 & 10x9. Hardinge 6'x3', 8'x30" & 6'x9". Misc. Tube Mills 5' & 6' x 22". Sturtevant Ring Roll. Raymonds, Kents, Fuller-Lehigh, Etc., Etc.
CRUSHING PLANTS: No. 65 Diamond No. 22 Pioneer 8x24. 1030 Good Roads, 9x40 Austin-Western, 9x36 C.B.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Dragline, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kilns, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Shacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

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7229 Roger's Avenue CHICAGO

Gyratory Crushers: Allis-Chalmers 5, 6, 7½, 8 and 10K, Kennedy Nos. 5.10S, 25 and 37. Various Telsmith.
Jaw Crushers: Universal 8x12, 10x20, 10x30 and 15x30. Farrell 13x24, 14x30, 18x36, 24x36. Champion 10x30, 22x50". Buchanan 12x36".
Single Roll Crushers: McL. 18x24, 21x24, Fairmont 36x60", corrugated shell.
2, 3 and 4-yard Koppel & Atlas 36" ga. Dump Cars.
Traction Ditchers, various sizes and makes.
4 and 8-ton 24" gauge Gasoline Locomotives.
5 Miles 24" gauge Portable Track.
⅝-yd. P. & H. Gas Shovel, Buda Engine.
1-Yard Osgood Comb. Gas Shovel Crane.
1¼-Yd. Thew-Lorain Steam Shovel, good.
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160 HP. Chgo. Pneu. Nat. Gas Engine, excellent.
180 HP. Fairbanks VA Diesel Engine.
100 HP. Fairbanks VA Diesel Engine.
Compressors, Elevators, Screens, Conveyors.
What do you need? What have you for sale?

MID-CONTINENT EQUIPMENT CO.
710 Eastgate
PA-2290 St. Louis, Mo.

USED SPEED REDUCERS

All Sizes - Types - Makes
Conveying Equipment
Immediate Delivery
All Materials Overhauled, Guaranteed
SAVE ON NEW COSTS

Patron Transmission Co.
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ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C., for sale at Attractive Prices. Large Stock. New and Rebuilt. All fully guaranteed. Send us your Inquiries.

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AIR COMPRESSORS
BELTED: 355, 523, 676, 1000, 1300 & 1570 Ft.
ELECTRIC: 475, 676, 807, 1302, 1722 & 2200 Ft.
DIESEL: 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.
STEAM: 49, 310, 526, 1300, 2200 & 3600 Ft.
CLAMSHELL BUCKETS, SKIPS & GRAPPLES
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2 Yd. OWEN Type S Material Handling.
1½ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
18 Steel Skips 6⅛ x 6 x 2½.
5 Ton Bucyrus Rock Grabs.
CRANES AND DRAGLINES
¾ Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft . Boom.
25 Ton BROWNING & 30 Ton AMERICAN Lees.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.
CATERPILLAR SHOVELS
¾ Yd. Lima Diesel.
2 Yd. Marion Steam Shovel.
¾ Yd., 1¼ Yd., 2 Yd. & 4 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas.
1½ Yd. LIMA Diesel.
1½ Yd. BUCYRUS 41B Steamer.
4 Yd. Bucyrus 120B Electric. Also 3 yd. Erie Elec.
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46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
15—Std. Ga. 50 Ton Battleship Gondolas.
FLAT CARS
9—50 ton std. ga. heavy duty flat cars.
HOISTING ENGINES
Gas: 15, 30, 60, 100 & 120 HP.
Electric: 30, 52, 80, 100 & 150 HP.
Steam: 6¼x8, 7x10, 8¼x10, 10x12, 12x14.
DIESEL UNITS
75, 90, 180, 200 HP. F. M. Engines.
110 HP Ingersol Rand Engine.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.
BALL, ROD AND TUBE MILLS
6x8 Pebble Mill & 5x5 Batch Mill.
5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x8, 8x8 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills & 6'x23'.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.
PULVERIZERS
JEFFERY, 24x20 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto Pulveriser No. 0000, 0 & 3.
RAYMOND Imp. Mills, No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 ft. Chaser M.
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MATERIAL BIN
116 Ton Blaw Knox 2 Compt.
400 BARREL CEMENT BIN
400 Barrel Butler Portable Steel Cement Bin with Fuller automatic batcher, push button control.
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8, 10 and 14 ft. Separators, Gayco & Bradley.
ROLL CRUSHERS
36x60 Fairmount & 36x20 Diamond.
JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12, 30x15, 30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x24, 48x36, 60x42, 84x66, 36x16, 9x36.
CONE & GYRATORY CRUSHERS
42 in. McCully Mammoth Gyratory.
5 Nn. 19, 25, 27 & 49 Kennedy.
18 in., 24 in., 30 in., 36 in. & 48 in. Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 2 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch 8 in. Traylor T. Gyratory.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 105.
6, 10 & 13 Inch Superior McCullys.
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100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2200-250-275 v.
200 K.W.RIDGWAY 3/60/2200-250-275v.,900 rpm.
SLIP RING MOTORS
52HP. GEN. ELEC. 3/60/440 v., 1200 rpm.
(3) 100 HP.GEN.ELEC. 3/60/440v.,900-1200 rpm.
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BELT: 1000 Ft.60 In., 700 Ft.40 In., 600 Ft.36 In., 800 Ft.30 In., 1642 Ft.24 In., 517 Ft.20 In., 297 Ft.18 In., 500 Ft.16 In., 300 Ft.14 In.
IDLERS: 54 In.,42 In., 36 In.,30 In., 24 In.,20 In.,18 In.,16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft.24 In.,30 In.&36 In.Sections.
ROTARY DRYERS AND KILNS
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STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom,25 Ton 100 Ft.Boom,75 Ton 135 Ft.Boom.
LOCOMOTIVES
GASOLINE: 3 Ton,5 Ton,8 Ton,12,14,and 30 Ton.
STEAM: 9Ton,20 Ton,40 Ton,60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
DIESEL: 4, 8 & 15 Ton.
SCREENS
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HUMMER ROTEX, NIAGARA & ROBINS.
REVOLVING: 3x12, 3x16, 3½x18, 3x36, 4x16, 4x30, 4x33, 4x24, 5x30, 5x20, 6x20.

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1—18" x 45' Link Belt stationary conveyor, troughing belt type, elect. or gas power.
1—24" x 25' Northern portable belt conveyor, elect. power.
1—14" x 25' Farquar portable scoop conveyor, gas power.

CRUSHERS
1—No. 4 Champion jaw crusher, size 9x15", Ser. No. 2606.
1—No. 2 Climax jaw crusher, size 9x16".
1—Buchanan jaw crusher, size 10x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—Allis Chalmers, No. 5 gyratory crusher, Ser. No. 5331, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".

DERRICKS
3—Steel guy derricks; 1—20-ton American-Terry 90' mast, 110' boom; 1—5-ton Terry guy derrick, 70' mast, 60' boom; 1—5-ton Insley, 75' mast, 80' boom; stiff leg derricks; 1—12-ton, 75' boom for hook work; 1—2-ton Pittsburgh, 26' boom, 15' mast. Also a number of wood stiff leg derricks, 1 to 5-ton capacity.

HOISTS (Elec., Gas, Steam)
55—Electric ranging from 20 HP up to 125 HP, consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.
Gas hoists ranging from 8 to 120 HP, single, double and triple-drums; all standard makes. (38 in stock.)
Steam, ranging from 8 HP to 60 HP, single, double and triple-drums; all standard makes.

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1—7-ton Plymouth type 2, Model D. L. 24" gauge locomotives, power gasoline engine.
3—7-ton Whitcomb type MO 24" gauge, power gasoline engines.
1—7-ton Plymouth 24" gauge type 2 Model HL power gasoline engine.
1—3½-ton Plymouth 24" gauge Model A L 105, gasoline power.
1—3-ton Whitcomb 24" gauge, type U T gasoline power engine.

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1—10" Morris sand pump, Ser. No. 86864, cap. 87 cu. yds. per hr.
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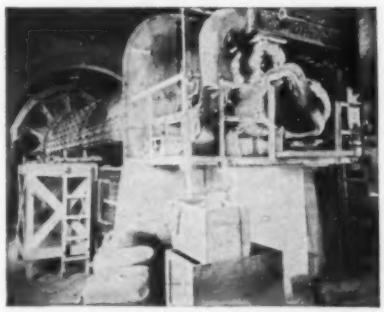

Allis Chalmers 7 x 30 Tube Mill

1—Allis-Chalmers Dry Grinding Compeb Mill, No. 8745. This is a four compartment mill with the first compartment 10' long and 8' in diameter with taper the rest of the 45' length of the mill 7' in diameter. The mill has chilled iron liners, and 36" table feeder, 72" Cutler Hammer, Magnetic Clutch, and 3 compartment Dust Collector.
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14—30" Griffen Mills.
26—42" Fuller Lehigh pulverizers, each with belt idler.
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1—5'6" diameter x 22' long F. L. Smidth & Co. Tube Mill with chilled iron lining and steel heads and trunnions. Trunnion discharge.

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120 Ton Steel Balls, ¾" to 5".

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All complete with blowers, feed pumps, feed water heaters, etc.

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1—Allis-Chalmers Fairmont Roll Crusher, 36" x 60".
2—No. 6 Gates gyratory rock crushers.
1—No. 6 McCully gyratory rock crusher, style K.
5—No. 5 Gates gyratory crushers.
1—Mosser rotary clinker crusher.
1—No. 10 McCully gyratory rock crusher with extra gear, eccentric and bell.

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35,184	18'4" x 70' x 27'5" high
19,592	11'3" x 40'6" x 43' high
10,440	12' x 58' x 15' high
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7,460	10' x 55'3" x 13'6" high
6,827	12'8" x 44' x 12'3" high

Also various BINS as follows

4—	1,650	cu. ft. and under
1—	1,116	cu. ft. and under
5—	896	cu. ft. and under
6—	640	cu. ft. and under
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12—	370	cu. ft. and under
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2—	95	cu. ft. and under
1—	37	cu. ft.

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14"—16"—18"—20"—24" and 28" Centers varying from 30' to 203'. Same with movable Trippers.

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3—Vulcan Iron Works steel rotary kilns, 8'6" x 7'6" dia., 125' long, fire brick lined.
1—Vulcan Iron Works steel rotary kiln, 7'6" x 7' dia., 125' long, fire brick lined.
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1—Ingersoll-Rand 18¼" x 14" x 18" horizontal duplex air compressor, belted motor drive, with 3'6" x 20' riveted steel air receiver.
1—Ingersoll-Rand Duplex Air Compressor, 11" x 16" x 18" belted motor drive.

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2—W. F. Mosser & Son steel rotary dryers with 65" steel stack.
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1—W. F. Mosser & Son steel rotary dryer, 72" x 60" dia., 55' long, bevel gear drive, with counter shaft and 50' steel stack.
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NEW SPARE PARTS FOR ALL ITEMS

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6—Engine Generator Sets. 800 KW, 750 KW, 575 KW, 475 KW and two 400 KW D.C. sets.

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4—Buffalo forge blowers and exhausters.
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1—8' x 22' Oil or Water Tank.

1—Jeffrey Bucket Loader with Electric motor on steel wheels.

3—Complete crushed stone Plants with 24 x 36 and 18 x 36 Jaw Crushers, secondary crusher, elevator, screens and motors.

1—Complete Pulverizing Plant, consists of Hardinge Conical Mill, Gayco Separator, steel encased elevator and Electric motors.

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COMPLETE STONE CRUSHING PLANT

Capacity 850 tons per day. Principal items are: 1—Farrel 24 x 36 Jaw Crusher, 1—Traylor 3' type TY Reduction Crusher, 1—4 x 12 triple deck Screen, 1—long 24" Belt Conveyor and 1—short 24" Belt Conveyor; complete with steel bins. Plant can be operated with electric motors, all of which electrical equipment is available, or can be operated with two 100 HP. Diesel Motors and one 50 KW Diesel motor generator set. Plant all set up in working position, perfect condition throughout, immediate delivery.

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1 Universal Power Stripper. Like new.
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50 Steel Racks.
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- Sand Settling Tanks
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1—Hardinge Mill, 7'x36", with titanite liners and air classifier.
2—Steel Bins 7'x7'x6' high straight side, with 8' cone, ⅜" steel.
1—Steel Bin 5'x5'x3' straight side with 6' cone, ¼" steel.
4—Chain Bucket Elevators, with steel housing 40' to 50' centers, buckets 10"x6" to 13"x8".
5—Tyler Hummer Screens, 3'x5', 4'x4'.
1—Farrell 30"x12" Crushing Rolls.
10—Jaw Crushers, 7"x10" to 24"x36".
1—Jeffrey Hammer Mill, 24"x36".
13—Hammer Mills, Williams, Jeffrey, Gruendler, American, etc.
1—No. 5 McCully Crusher.
7—Rotary Dryers 4'x20' to 6'x60'.
2—Rotary Kilns 8'x125', 8'x9'x200'.
3—Smidth 6'6"x21'6" Tube Mills.
2—Williams Universal Pulverizers, No. 3.
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1—60-ft. steel underframe flat car, 40 ton.
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36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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	25 "	6.25
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	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

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I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
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Bucyrus Erie Model 1630 Electric Tunnel Shovel.
Bucyrus Erie 50B Steam Shovel, 2 yds.
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Brownhoist, 5-7½-ton Crane, gas.

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1000-ft. 36" Belt Conveyor, with Rollers and Idlers. Complete except no frames. Like new.
60' Belt Elevator 14" x 11" x 7⅝".
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Barber Greene Model 44A Loader, rebuilt.

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4—Gardner-Denver Wagon Drills.
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Complete Rock Crushing Sand & Gravel Plants.

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¾-yd. Haiss Clamshell, rehandling.
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Vulcan 8-ton, std. gauge, gas.
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Vulcan 6-ton, gas, 36" gauge.
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25' elevator with 6" malleable buckets on chain.
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Williams No. 2 "SEMI-VULCANITE" hammer mill.
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1000' of 30" 6-ply conveyor belt.

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1 7½D Gates Gyratory Crusher 42"x20".
1 Colorado Iron Works 30"x10" Improved Standard Crushing Roll, spring tension, cast steel rolls, steel enclosed.
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1 Chalmers & Williams 36" Symons patent horizontal disc stone crusher.
1 National Hoisting Engine Co. 200 H.P. single geared, single drum, electric hoist, 48"x64" drum; spur gear connected to—
1 Westinghouse 200 H.P. slip ring induction motor.
1 Pneumatic toggle joint car dump, 13'x7'.
2 Koppel Kiln Stone Cars 66"x72" side dump.
1 Broughton Mixer.
1 Hair Picker.
1 A. D. Cook, size 11 vertical geared deep-well pump.
1 3½ ton Clyde Hydrator.
1 Jeffrey Mfg. Co. 42"x24" type A Swing Hammer Mill, direct connected to—
General Electric 50 H.P. Induction Motor.
1 Bucyrus 110-C Steam Shovel; caterpillar traction.
2 Steel Tanks 34'6"x80'0".
1 Iron Clad Structural Steel Building, 41'x100'.
1 General Electric Co. 50 k.w. D/C Generator—type CL-90—form B—200 amps. 250 volts—1080 R/P/M—complete with rheostat—sliding base—paper pulley.

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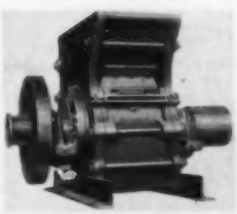

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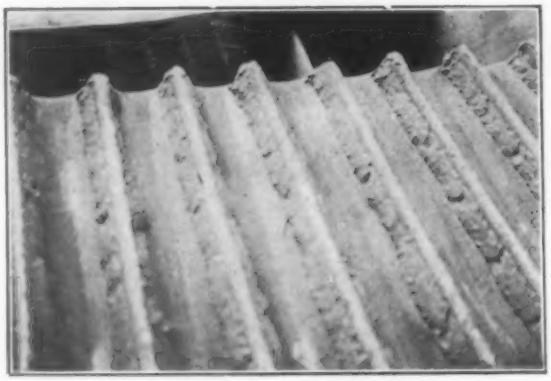

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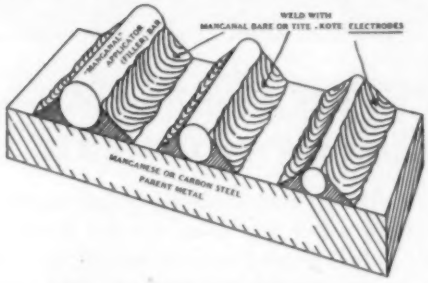
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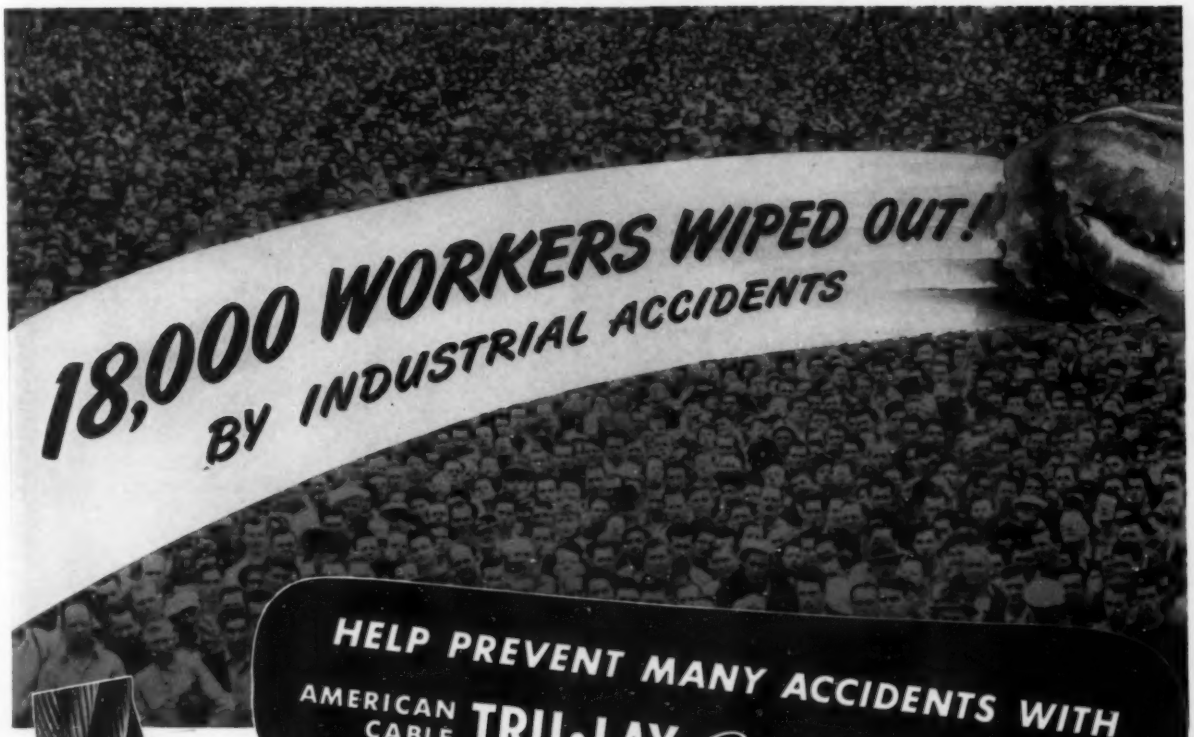

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With new equipment reserved for our armed forces and existing equipment called on to take the punishment of wartime, highspeed 3-shift service, we've all got to pitch in and do a maintenance job as never before. Here are a few special hints that will prolong the useful life of your hydraulic Bullgraders and Bulldozers and keep 'em producing at top speed:

1. Watch the cutting edge and don't allow it to wear down to where the supporting casting is damaged.

2. Cutting edge can be reversed to give longer service when front edge is worn.

3. Keep the corner bits built up and hard-faced.

4. Don't allow pins to wear down too far before replacing or building up.

5. Inspect the blade and frame regularly for fatigue cracks, and weld them before they become serious.

6. Checking the hydraulic system should be regular routine. Be sure that oil is up to level and system is clear of air. A jerky, noisy machine is air-bound; a smooth one is free of air.

7. Drain the oil when it is dirty. Floating particles wear the pump and valve.

8. Keep all hose and pipe connections tight to prevent loss of oil and infiltration of air.

9. Inspect hydraulic hose to be sure it won't chafe and isn't twisted.

10. Keep bolts tight and all parts of the machine adjusted correctly.

11. Clean off dried mud or caked grease and maintain paint surfaces on all parts not subject to abrasion or moving contact.

12. Lubricate regularly. Use good grade lubricants and follow manufacturer's instructions carefully.

Your International TracTracTor Distributor will gladly advise you regarding proper maintenance and lubrication.

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